

EXPERIMENTS
IN
AGRICULTURE,

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Made under the DIRECTION of

The RIGHT HONOURABLE and HONOURABLE
DUBLIN SOCIETY,
In the Year 1770.

In which the CABBAGE HUSBANDRY is further
pursued; the Culture of RAPE in various Methods
as Food for Cattle; the Culture of CLOVER, and
its prodigious Value to the Farmer, exemplified by
Experiments; the Culture of WHEAT by different
Methods, and other Interesting Subjects.

BY
JOHN WYNN BAKER, F.R.S.
And EXPERIMENTER in AGRICULTURE to the
DUBLIN SOCIETY.

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MDCCLXXI.

EXPERIMENTAL
AGRICULTURE

With a description of the various experiments

and the results of the same

DUBLIN SOCIETY

In the Year 1750



JOHN WYNN, F.R.S.
and the Committee of the
DUBLIN SOCIETY

DUBLIN
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TO THE
RIGHT HONOURABLE and HONOURABLE
DUBLIN SOCIETY.

My LORDS and GENTLEMEN !

I HAVE had the honour to dedicate to Your protection, a register of some of my experimental enquiries in Agriculture for some years past, with several other papers, upon the subject of rural œconomy ; and Your kind acceptance thereof, encourages me to beg Your protection of the following sheets.

The manner in which my experiments have been carried on, and the form in which they have been laid before the publick, I presume not to form any judgment of :—The continuation of Your countenance and protection, is the *test* of your approbation ; and the publick imitation of my pursuits, bespeak their utility. —Considerations, which, on the one hand, fill my mind with *gratitude*, on the other with *pleasure*.

Your long experience of my endeavours, in the cause of Agriculture, has induced you, with a most honourable consent of voices, to place these pursuits, in a conspicuous light, and to establish them upon a firm basis,

At the same time, that I thank You with all my heart, for a confidence, which reflects so much honour upon me ; allow me to assure You, that Your protection shall never be disgraced, by any failure in application at least, to promote Your views to the utmost of my power.

I confess, that for some time past, I have carried on these undertakings with timid caution ;—the constant

attendant on uncertainty:—These sheets which I now lay before You, relate to matters depending, during suspense; but in the perusal, You will find an indication of change in my experimental enquiries: The expence and produce of fields stated; and in one instance, *surprisingly* supporting improvements, which are convenient, substantial, and elegant.

At the same time, that experimental enquiries in Agriculture, afford amusement and delight; allow me to assure You, that a man had not need pursue, a more expensive entertainment, nor to have any other avocations of pleasure, to break in upon the application which they require; and therefore, he will be best suited for such a pursuit, whose mind has been satisfied, or rather satiated, with the gaudy trappings of the world, which allure half mankind; how far this may be my case, I shall avoid to describe in any other manner, than just to say, that I *think*, I have *seen* the world; under that circumstance, perhaps I have adopted the occupation which every man wishes for more or less, sooner than the generality of active spirits; but it seems to be so much the propensity of mankind, whether *Statesman* or *Senator*, *Soldier* or *Sailor*, *Tradesman* or *Mechanic*, that after running all the rounds of different callings, and different pleasures, *ALL ends in*, the *AMBITIOUS* view, of being a *FARMER*.

In this *ultimate* object of mankind, my case happens to be particular, because I am, under Your protection, open to the *scrutiny*, *application*, and *correspondence* of the multitude, under the acceptance of *EXPERIMENTAL Farmer*.—I can only say, that I will endeavour to do my duty.

Small experiments are always most accurate, because they are most under command; and carry with them information, and full conviction, to men of knowledge and science, so as, sufficiently to direct their imitation thereof, in the field at large.—But I have been so long, an experimental farmer, and am so well acquainted with the contempt, with which the lower tenantry look on small experiments, and gentlemen farmers,

DEDICATION.

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farmers, that I am convinced, nothing less than fields at large, will prevail upon them to imitate any improvement, which may be recommended to their attention.

To this end, I propose by degrees, to bring most of the fields constituting my farm, under experiments, and to introduce them into my future reports, with an account of the expence and produce, and the charge of all the improvements which I shall make in each field, stating the whole, whether loss or gain.

And in this pursuit, I propose to adhere as closely as possible to the idea, which I have so strongly urged in my *Practical Agriculture Epitomiz'd*, of at least lessening the use of fallows, (which I am of opinion, is practicable) and of introducing *courses of crops*, by alternately changing the *ameliorating* and *impoverishing* ones, in a manner, similar to what is there set forth.

And in order, to render the nature, and state of the farm as clear, and intelligible as possible to my readers, I intend to have a new survey of the whole, with the gross and net contents of each field, in the acres of every kind, which are in use in this kingdom. The map I propose to have engraved, and shall every year, furnish my reports with the same, referring the reader to the map for the field he may be reading, of which, a small beginning is made in this report, where I have referred to the fields, by their numbers, in my present map.

Besides this, I intend to devote one field, to variety of small experiments, which I mean to conduct with the most minute exactness in every particular, and also, variety of manures, not only of *quality* but of *quantity*; different successions of crops, as well as various methods of culture; and as these shall answer, I intend to carry them into the fields at large, for the fuller information and conviction of the publick.

By

DEDICATION.

By this double pursuit, I flatter myself, that Your object of instructing the farmer, will be answered in a very general manner.

And if I live to accomplish, all that I see before me in this view, I shall differ, in my sentiments, with the general acceptance, of the *farmers* department being *bumble*—mine, I shall consider glorious, and the *more* so, from being under Your protection.

Considerations, which will ever animate me

to approve myself, upon all occasions,

My Lords and Gentlemen,

Your truly faithful,

and most obedient

humble servant,

JOHN WYNN BAKER.

LAUGHLINSTOWN,

July 25th, 1771.

INTRODUCTION.

ON the first of February, 1770, the DUBLIN SOCIETY were pleased to call upon me to lay before them a Plan, upon which to found a system of Experiments in Agriculture.—Accordingly, I did soon after lay before the Society, two papers upon that subject, which they referred to the consideration of a select committee of gentlemen, most knowing in agriculture, chosen by the Society for that purpose.

This committee met from time to time, and after closing their resolutions, made their report on the 8th of March, 1770, to the following effect, and caused one of the papers referred to them, to be printed in the proceedings of the Society.

“Lord Arran reported from the select committee appointed to take into consideration the two papers laid before the SOCIETY by Mr. Baker, the one entitled, *Hints for the Improvement of Agriculture by Experiments*; the other, *A Plan for various Sets of Experiments*; and to report to the SOCIETY, what course of experiments they judge it will be most useful to the agriculture of this kingdom to be pursued, for what number of years they would recommend such experiments to be carried on, and the quantity of land which they would think proper to be employed in the same; that the said committee had met, pursuant to order, and came to the following resolutions.”

“RESOLVED,

“1st, That this committee do highly approve of the general system contained in Mr. Baker's paper, entitled, *Hints for the Improvement of Agriculture, by Experiments*, which is as follows.”

“Hints

"HINTS for the Improvement of Agriculture, by Experiments, submitted to the consideration of the Dublin Society, in consequence of the sentiments which appeared amongst gentlemen at a meeting of the Society on the first of February, 1770."

"The vulgar and common practised methods of agriculture, are mistakenly calculated for a little immediate gain, without regarding future emolument; and therefore tend to the too general impoverishment of land."

"The reverse of this practice, I conceive to be the object of the DUBLIN SOCIETY."

"To harmonize live stock, and tillage in such a manner as to increase one, and improve the other, I apprehend will most effectually accomplish their laudable purpose."

"It therefore follows, that the man who shall maintain the most live stock, and produce the greatest quantity of corn, upon any given quantity of ground (regard always being had to the nature of the land when he enters upon it) will indisputably be the most useful member of the community, or in other words, will be the most judicious occupier of land."

"For these reasons :—"

"That the more live stock he maintains with a small quantity of ground, the more manure he will accumulate."

"It therefore follows, that more corn will be produced than can be by the common practice of devoting farms wholly to tillage, or wholly to grazing, and that the improvement, instead of the impoverishment of the land, will progressively increase, provided his manure is judiciously disposed of."

"For,

"For, contrary to the received and established maxim, that the land is to maintain the live stock, I conceive, that the stock is to maintain the land; from this undeniable and experienced consequence, that where all is taken away, and that nothing is returned, poverty must ensue."

"Hence it is, that we have so many worn-out farms."

"These maxims then, lead to this, first and fundamental principle, that the business of the farmer, is first to provide way and means, upon the *cheapest* terms, for not only plentifully maintaining, but annually increasing his live stock, which we see from the preceding rules (abstracted from the profit the animals afford in their natural produce by dairy, wool, labour, and sale of themselves) are in general, to be the source from whence improvement, health, and luxuriance is to appear in corn upon the surface of the farm."

"And most happily for mankind, it appears, that nature has not only furnished a great variety of pastures, amazingly plentiful (not hitherto much in use) which will not only maintain a considerable live stock, at a cheap rate, but most excellently prepare land (much beyond the common preparations) for the reception of corn."

"It hence follows to examine what the plants are, which will afford these manyfold advantages."

"They appear to most advantage under the following heads, some for Summer use, some for Winter, and some for both."

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Number of kinds.

N ^o .	1.	The Cabbage.	25.	} Some for Summer and some for Winter use.
	2.	The Turnip.	9.	
	3.	The Rape.	4.	Chiefly for Winter use.
	4.	Carrots.	5.	For Sum. and Wr. use.
	5.	The Parsnip.	3.	For Winter use.
	6.	Lucern.	4.	Ditto.
	7.	The Trefails.	25.	} For Summer use green, for Winter use in hay.
	8.	Sainfoin.	3.	
	9.	Common grasses.	36.	
	10.	The Vetch.	31.	} 16 at least. The grain & straw.
	11.	Lentils.	3.	
	12.	The Pea.	4 at least.	Ditto.
	13.	The Horse Bean.	5.	} With many seminal va- riations.
	14.	The white Corn.	5.	

The straw for Winter fodder and litter."

"Of these plants N^o. 1. 2. 3. 6. 7. 9. 11 and 13. are the most valuable, to obtain profit and solid improvement at the cheapest rate.—And of these, I have much reason to believe N^o. 1. 2. 3. 7. 10 and 13. to be preferable to all the rest, because they are abundantly prolifick, and are to be obtained in plenty by easier means than some of the others; and N^o. 1. 2. 3. 7. 10 and 13. afford the best preparations of land for the reception of white corn."

"Thus we have before us a great variety of plants, which will afford the advantages sought for, if the most ameliorating, as well as the most prolifick of them are chosen, and the most judicious methods of cultivation ascertained."

"How to make these discoveries can only be come at by a series of repeated experiments."

"To prevail upon the farmer to adopt their use, and the best culture of them, will be best effected by exhibiting to his view and inspection large plantations of such as experiments shall prove to be most profitable.

Because

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Because, when the exhibition shall be large, the too common idea of impracticability vanishes, and the practice is thereby rendered more familiar.—And the crops of corn which will follow these without the expence of fallow, I expect will be truly inviting to him, upon his own and only principles of looking for profit.”

“ The use of these plants for feeding cattle, leads into another set of consequential experiments, to ascertain how much more they can or will eat of one plant than of another, and thereby will determine which are to be preferred, always retaining in view the important object of preparing the land for corn.”

“ From these heads, gentlemen are apprised of my ideas as to the pursuits of an experimental farmer for the publick information.—And from these heads, I submit to the consideration of the Society, what mode of experiments they would please to have pursued, as some gentlemen, perhaps, may think of modes of conducting experiments, which do not occur to me.”

“ Enquiries upon speculative and philosophical principles, are collateral pursuits, which will often afford discoveries, but principally tend to unfold the *causes of certain effects*. A species of enquiry which I should be fond of, and shall either pursue it or not, as the Society shall think most proper.”

February 1770.

JOHN WYNN BAKER.

“ RESOLVED,”

“ 2d, That it is the opinion of this committee, that instructions be given to Mr. *Baker* to proceed in making the following experiments in agriculture, viz.

I.

“ In the culture of rape as food for cattle, and as preparative to land for the reception of seed corn.”

“ 1st,

" 1st, Three acres to be sown with rape this present month of *March*, for feeding cattle in Summer, and to be succeeded by wheat sown in *September* or *October* next."

" 2d, Four acres to be sown with rape in *August* next, for early Spring food for cattle, to be succeeded by oats or barley to be sown with clover the same spring."

" 3d, Four acres of wheat stubble to be sown with rape in *September* or *October* next, for spring food for cattle, to be succeeded by turnips or cabbages in summer." *

" *In the culture of Sainfoin.*"

" One acre to be sown in the common husbandry with sainfoin, one half without corn, and the other half with ten stone of oats."

" One rood to be sown this spring with burnet in drills."

IV.

" *In the culture of Cabbages.*"

" Two acres to be planted this spring with different kinds of cabbages, to discover their comparative value."

* I have here omitted a part of this third instruction, which I conceive must have been a mistake.—I purposely avoid giving the reasons here, but shall have pleasure in giving them to the Society, if they think it necessary."

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V.

"In the culture of wheat."

"Six acres of clover-lay to be sown with wheat in September or October next.

"RESOLVED,"

"3d, That it is the opinion of this committee, that Mr. Baker do continue to pursue the following experiments now depending at his farm, according to an order of the 20th of April last, whereby instruction was given to him to extend his experiments in regard to the maintenance of cattle both in Summer and Winter seasons."

"1st, Sixteen acres of clover for the Summer maintenance of cattle."

"2d, One acre of cabbages for Autumn."

"3d, Five acres of cabbages of various kinds for Winter use."

"4th, Four acres of turnips of various kinds for winter use."

And at my particular request, this committee passed the following resolution.

"RESOLVED,"

"4th, That it is the opinion of this committee, that the committee for agriculture, do from time to time view the above experiments in their progress, and report to the Society the manner in which they may appear to them to be executed."

I can only regret, that gentlemen who are of the society, and consequently of this committee, cannot make it convenient to themselves to visit the experiments more frequently as a committee: I am always
glad

glad to see them in small parties, in the excursions which most of the members make at different periods, to look at the progress of my pursuits; but I submit to gentlemen, whether it is not for the honour of the Society, and the security of the publick, that they should, at least three or four times in a season, appear here in the capacity of their committee for Agriculture, with their chairman of that committee, to inspect into the state and progress of the undertakings I am engaged in? for without the chairman, I conceive, be the number ever so large, they cannot be a committee. — I have often solicited this; and so convinced is the Society of the propriety of such inspection, that a resolution to the same effect of the one just now recited, has always been passed when I have requested it. — I now venture to take this public method of soliciting the visits of the committee, as being the last effort which I can make to prevail upon them.

“ Then, the question being severally put upon each of the resolutions, the Society agreed with their committee in the same.”

The informations which the Society and the publick are to receive in this report, correspond as nearly as contingencies and unforeseen events would admit of, with the preceding resolutions and instructions, and are as follow.

ARTICLES

ARTICLES UNDER EXPERIMENT,

In the YEAR 1769.

- N^o. 1. Rape sown in Spring, for feeding cattle in Summer, to be succeeded by wheat.
2. Rape sown in August, for the Spring food of cattle, to be succeeded by cabbages,
3. Rape sown on wheat stubbles in Autumn, for Spring food of cattle, to be succeeded by Spring corn.
4. Sainfoin, sown with and without Spring-corn.
5. Cabbages, viz.
- | | |
|------------------------|----------------------|
| Anjou Colewort. | } All Winter Plants. |
| Scotch Cabbage. | |
| Flatt Dutch Cabbage. | |
| Red Cabbage. | |
| Flatt Dutch Cabbage. | } All Spring Plants. |
| Green Savoy Cabbage. | |
| Large Scotch Cabbage. | |
| Turnip Cabbage. | |
| Long-sided Cabbage. | |
| Turnip Rooted Cabbage. | |
| Boqrcole. | |
| Brocoli. | |
6. Summer use of Broad-red Clover, in the maintenance of cattle.
7. Wheat in drills, preparative to the same grain in broad-cast.
8. Wheat on Clover-lay.
9. Apple Potatoes.

EXPE-

INTRODUCTION

ARTICLES UNDER EXPERIMENT

1. Rape sown in Spring, for feeding cattle in summer, to be succeeded by wheat.
2. Rape sown in Autumn, for the Spring food of cattle, to be succeeded by cabbage.
3. Rape sown in Autumn, for Spring food of cattle, to be succeeded by Spring corn.
4. Grain sown in Autumn, and without Spring corn.
5. Cabbage, viz.
 - English Cabbage
 - Scottish Cabbage
 - Flat Dutch Cabbage
 - Red Cabbage
 - Flat Dutch Cabbage
 - Green Savoy Cabbage
 - Large Scotch Cabbage
 - Small Scotch Cabbage
 - Long-ribbed Cabbage
 - Trump Scotch Cabbage
 - Broccoli
6. Summer use of flax and clover in the main-tenance of cattle.
7. Wheat in hills, preparative to the same grain in broad-cast.
8. Wheat on Clover-lay.
9. Apple Potatoes.

EXPERIMENTS I N AGRICULTURE.

GENERAL EXPERIMENTS on RAPE, as FOOD for CATTLE.

EXPERIMENT the FIRST.

Rape sown broad-cast in Spring, with an intention of having it as a mowing-pasture for cattle in August and September, and to be succeeded by wheat.

THE land chosen for this purpose, this year, is a shallow soil, of a strong adhesive nature when wet, and when perfectly dry, in lumps, almost impregnable, but between wet and dry, reducible.—It lies upon a bed of lime-stone quarry, and has a natural declivity to the north-west.—Naturally very poor, and I believe never received any manure until I dressed it.

In the year 1768, I planted three acres of it under potatoes, in the ordinary method of the country, in

18 General Experiments on Rape, &c.

seven feet beds, and *four* feet trenches.—In 1769, I had it under different kinds of drilled turnips, as appears in my Report for that year.

The frost, snow, hail and rain which we had this year in the months of March and April, rendered it impossible to get the ground in any tolerable condition for the reception of the rape seed, before the 28th day of April.—On that day, twenty broad sets were sown, with twelve ounces of rape seed to each set or ridge.

I intended to have sown it earlier, but the event will shew, that as it was, I sowed it too early, at least upon this ground.

The rape was slow in coming up, partly owing to be sure to the coldness of the weather, and did not grow in that luxuriant spreading manner which I expected.—It made but a poor figure until July, then it looked pretty sappy, and tolerably vigorous.

A great quantity of charlock appeared in it, all which I had pulled up by the roots on the 16th and 17th of July, which cost me 9s. 1d. by the employment of nineteen children, and a man to attend them.

After this weeding, I began to retain better expectations from the rape, as it shot forward, and I began to hope, would afford a plentiful mowing crop for the purpose of foddering the cattle.

But instead of that, it soon began to run up very fast, shortly broke out into branches, with few and small leaves, like rape in blossom from autumn sowing, but with strong branches and few leaves; and in a short time after, began to grow hard and pipey, and the seed to form.

In September, I began to mow it for the cattle, and they eat it with great eagerness; but every day it became worse, by growing harder, insomuch, that before

before it was exhausted, there was very great waste, as to the object of fodder, but it wonderfully raised the dunghill, which in my mind is of the first moment to the farmer; for if he has manure in plenty, and disposes of it judiciously, there is hardly any thing he need to fear except climate.

It was pretty far in October, before all this rape was cut, (and the seed coming forward very fast) although it was brought home in great profusion.

It was so strong, that the mowing of it could not be accomplished with a common scythe, it would have broken an hundred; but I have by me, a short strong scythe, with a thick back, intended to mow bushes and other rubbish.—with this instrument I got it mowed, but not so close to the ground as I wished, it being next to impossible to mow such strong plants as these were, close to the ground; and I became the less solicitous about it, as from the strength of the rape stumps and roots, and the weeds which were upon the ground, owing to the rape shooting up in tall stems, instead of broad luxuriant leaves, which I looked for, I gave up my intention of sowing the ground with wheat, as was originally intended, and therefore I ploughed it up, and let it lie the winter, for the reception of spring corn.—Accordingly, I ploughed it again in spring, and sowed it with oats on the 27th, 28th and 29th of February 1771,—and in May following, with clover seed.

If this rape had branched out in broad luxuriant leaves, as the plant is inclined to do, from autumn sowing, there can be no doubt but it would have afforded a fine preparation of the land for wheat, because the shelter of the rape, and its attraction of dews and rain, would certainly have checked all weeds; but its running so soon, gave them room to rise, so as to render the ground unfit for the reception of wheat, to which the harsh and coarse stubbornness of the rape stumps and roots contribute.—Hence I conclude, that the rape was sown by much too early.

If by repeating this experiment, a season can be ascertained for sowing it in spring, so as to have it in luxuriance as a mowing pasture for cattle, in *August* and *September*, and to completely cover the ground, I think that in this case, it would promise to be an excellent preparation for wheat; but if it shall be found, upon repeated trials, that the spring, or early summer sowing of rape, will always cause it to run, in that case it cannot answer, either the purpose for cattle, or preparation for wheat, sown at either of *those* seasons.

However, I shall as soon as possible, repeat the experiment, at different periods in the same summer, in order to discover, how far nature will admit us to go, as to the object of preparing land for the reception of wheat with this plant, instead of fallow.

As this experiment seems to have sufficiently informed us that *April* is an improper time to sow rape for the purposes in view, I shall not trouble the reader with the produce in weight.—The oats, which have succeeded this rape, will have a place in my Report for the year 1771.

EXPERIMENT the SECOND.

Rape Transplanted from the above Sowing.

As the surest test, to ascertain whether I had sown the preceding rapes at the proper time, I determined to transplant some of it; accordingly, on the 16th of July, I transplanted the following rows; viz.

N^o. 1.—A ridge 4 feet wide, 32 perch long—plants
12 inches asunder.

N^o. 2. Do. — — — Do. — — Do.

N^o. 3. Do. — — — Do. — — plants 18 inches.

N^o. 4. Do. — — — Do. — — Do.

These

These plants, all of them, flourished much better than the former, and were at least four times the size of any of those left in the ground where they were sown. Nevertheless, these also run; but the cold nights coming on, prevented their forming their seed like the formers: they were vastly more sappy, and much better food for cattle.

These circumstances confirm I think, beyond contradiction, that for the two objects in view, this rape was sown too early.

The produce in weight, I shall not trouble the reader with, as I think these events will sufficiently dissuade him, not to embark, in this part of our pursuit, until, from further experience, we can furnish him with information, as to a more proper time for sowing the rape, the better to accomplish the two points in view,—or rather three, viz. That of producing pasture for cattle, instead of working fallow, and thereby, preparing the land for wheat.—Objects, of the first moment to the farmer and the community.

EXPERIMENT the THIRD.

Rape Drilled.

N^o. 1. Six ridges, 4 feet wide, and 32 perch long, drilled with single rows of rape.

N^o. 2. Six ridges, the same length and breadth, drilled with double rows of rape 10 inches asunder.

N. B. The double and single rows were drilled alternately on the same ground, on the 18th day of July.

N^o. 3. Six ridges, 4 feet wide, and 32 perches long, drilled with single rows of rape.

N^o. 4. Six ridges, the same length and breadth, drilled with double rows of rape 10 inches asunder.

N. B. These were sown in alternate rows on the same ground, on the 24th day of July.

The

The several rows were thinned the latter end of August; and twice horse-hoed during the summer.

On the 3^d. of April 1771, I had a row of each of these cut and weighed, and the produce was as follows.

		T. C.	Q.	lb.	
N ^o . 1.	Single row, produced	1	2	1	11 } Sown
— 2.	Double row, Do.	1	4	3	13 } July 18th.
— 3.	Single row, Do.	1	5	2	22 } Sown
— 4.	Double row, Do.	1	6	3	25 } July 24th.

Thus we have before us, the produce of a ridge of each kind. I shall compare the acreable produce, by first examining our quantity of ground in each ridge, in order to ascertain how many ridges will be required to make an acre.

The ridges we have seen were 32 perches in length, which being multiplied by 21, shews that our ridges were 672 feet long; and being 4 feet wide, we are to multiply the length by the breadth, and our answer will be 2688.

Thus we have the number of feet of ground in each ridge. This number then is to be the divisor of 70560, which are the number of feet in a plantation acre, and our answer will be 26, and 672 feet remainder. Thus we find, that 26 of our ridges, and 672 feet of ground, will make a plantation acre.

N^o. 1. We have seen that a ridge of the single rows in the first sowing, afforded 22 C. 1 Q. 11 lb. which being multiplied by 26, amounts to 29 T. 1 C. 6 Q. 6 lb. and our fraction of 672 feet, in the same proportion, to 5 C. 1 Q. 10 lb. both which being added together, makes our acreable produce, 29 T. 6 C. 1 Q. 16 lb.

N^o. 2. A ridge we have seen of the double row, from the *first* sowing, afforded 24 C. 3 Q. 13 lb. which being

being multiplied by 26, amounts to 32 T. 6 C. 2 Q. 2 lb. and our fraction of 672 feet, in the same proportion, amounts to 6 C. 0 Q. 21 lb. which being added to the former, makes our acreable produce, 32 T. 12 C. 2 Q. 23 lb.

N^o. 3. We have seen that a single row, of the second sowing, afforded 25 C. 2 Q. 22 lb. which being multiplied by 26, amounts to 33 T. 8 C. 0 Q. 12 lb. and our fraction of 672 feet, amounts, in the same proportion, to 6 C. 1 Q. 14 lb. which being added together, makes our acreable produce 33 T. 14 C. 1 Q. 26 lb.

N^o. 4. We have seen that a ridge of the double, from the second sowing, afforded 26 C. 3 Q. 25 lb. which being multiplied by 26, amounts to 34 T. 11 C. 1 Q. 6 lb. and our fraction of 672 feet, amounts in the same proportion, to 6 C. 3 Q. 0 lb. which being added together, makes our acreable produce, 34 T. 18 C. 0 Q. 6 lb.

RECAPITULATION.

	T. C. Q. lb.				
N ^o . 1. Single rows, per acre	29	6	1	16	} Sown the 18th July
— 2. Double rows, Do.	32	12	2	23	
— 3. Single rows, Do.	33	14	1	26	} Sown the 24th July
— 4. Double rows, Do.	34	18	0	6	

This table of recapitulation, furnishes two important pieces of information, which, though very uniform and satisfactory, we must not consider as quite conclusive; viz. The last sowing in July, we see, affords considerably greater produce, than the first, for the plainest reason, that the earlier we sow this seed, the sooner it runs, and consequently affords the less produce for our purpose of foddering cattle in the yards for making dung, and seems to account very strongly for the state of our first experiment.

The

The second piece of information is, that the double rows uniformly produce more than the single rows, and consequently indicate, that they are to be preferred, when rape shall be sown in drills for the purpose of foddering cattle in the manner aforesaid.

It may not be improper to inform the reader, that the ground upon which this drilled rape grew, was under cabbages the year before.

EXPERIMENT the FOURTH.

Rape in Broad-cast.

On the 24th of July, two acres of rape were sown broad-cast, ten pounds of seed to each acre.

The ground chosen for this purpose, although in the same field in which the former experiments were carried on, (for at present it contains 19 acres) seems to differ something from the soil already described. It is not so stiff by a good deal, has abundantly fewer loose stones in it, is very shallow, and poor, to an incapability of producing any thing to profit, without great assistance of manure.

In July, I manured it with the dung of my yard, consisting of that of horned cattle, horses and swine: the dressing was indeed very high; about two smart one-horse-cart loads to a perch. I having ever found, that one acre highly improved, is much more valuable, than five imperfectly handled, was the reason why I gave this poor piece so liberal a dressing.

This rape came on but slowly for a time, as I find to be the nature of the plant; but at length it shot forward, and flourished away; but in winter, it met with a fate which I was not aware of, nor did I expect. The wood pigeons lay upon it prodigiously, and did it great damage: some plants I observed in the frost, to appear as if they had been singed; whether that was

was owing to the wounds given by the birds, and thereby giving the frost the greater power, or whether it was entirely owing to the severity of the frost, is not in my power to determine.

However, very early in the spring, this rape shot forward, and as the days lengthened, the visits of the pigeons were less frequent, until they totally left it.

From this rape breaking out into blossom sooner than I expected, I am inclined to believe that the 24th of *July* is too early to sow it, for our purpose of foddering cattle in the yard.

However, early in *April*, I began to mow this rape for the horned cattle, such as cows, plough bullock, young cattle, calves, and swine; they all eat it with the greatest eagerness, and were foddered with it every evening, until the 19th day of *May* inclusive, and wheat straw in a morning; save, four calves of the preceding year, and they were foddered twice a day with the rape, and had straw before them also, and throve upon it vastly better than the other cattle, for no other reason, I believe, than because they were allowed more than the others; in short, they were in such order, that I dare believe that the butchers would have been glad to have had them for killing.

I need not tell the farmer, how necessary it is to be frugal of provender, in an harsh dry spring, as the last was, when he is like to be hard run with 40 head of cattle, many of which I should actually have been obliged to sell at so improper a season, had I not been possessed of this two acres of rape.

There is yet another circumstance, which renders this a truly valuable fodder:—The milk of the cows increased prodigiously, and the milk and butter were as good, sweet, and well flavoured I think, in every particular, as ever I tasted in *June*. Even the cream for the tea appeared to be perfectly free from any foreign flavour. The cows got hay every day, in the same manner

ner as I have in former years mentioned them to have when feeding on cabbages.

The simplicity of the culture for rape, for this purpose of foddering cattle, I cannot but think a particular recommendation of it to the farmer, and the cheapness of the seed in purchase, or the ease with which he may raise it, are objects which cannot fail I think of being persuasive to him.—And all persons, who have annexed to their farms, any bog, or other waste ground, the improvement of which, that can be executed by burning, might surely raise such quantities of rape for the purpose of mowing pasture, as would enable them to keep almost any number of cattle, by which, they would not only be bringing in the waste land, but making that the foundation of improvement to their sound land, by the immense quantities of dung they might raise by this means from the waste land.—Here the advantage to the cultivator would be double.

On the first day of *May*, I had four perches of this rape measured out for weighing.—It was mowed, immediately drawn home and weighed.—The four perches afforded 7 C. 2 Q. 0 lb. Multiplying this weight by 40, shews our acreable produce to be 15 tons. The quantity indeed but small.—However, the season in which it is to be had, renders it more than ordinary valuable, and I think bids fair, to make it become an object of husbandry, as a pasture for cattle. At present, I shall omit to say any thing further upon this subject, but shall repeat my experiments, in order to come at several facts, which strike me as being very material to be known.

EXPERIMENT the FIFTH.

Rape sown on Wheat Stubble.

Six acres under wheat this year, the land stiff, very inclinable to be wet, but pretty deep, I ploughed, as soon as the wheat came off.—Harrowed it down,
and

and on the 12th, 13th, 14th, and 15th of *September*, sowed rape in the whole field, and gave it a light bush-harrowing.—The rape came up very thin, and made so poor an appearance in the spring, that I ploughed up the field, and sowed spring-corn.

Here we see that this experiment totally failed, and is a strong indication, that but little is to be expected from sowing rape upon wheat stubble; because, after the wheat comes off, it seems to be too late in the year to sow the rape.—Something, indeed, may be charged to the natural moisture of the soil, and perhaps to its not being rich, although it is not poor; but I shall repeat this experiment in another way.

General Recapitulation of the several Experiments on Rape, as pasture for cattle.

Exp. 1. *April* sowing. Run, and did not answer the purposes sought for.

Exp. 2. The same. Transplanted, also run, but not so soon as the other.

		T. C. Q. lb.			
Ex. 3. <i>July</i> 18th sowing.	Single rows, per acre	29	6	1	16
	Double rows, per acre	32	12	2	23
July 24th	Single rows, per acre	33	14	1	26
	Double rows, per acre	34	18	0	6
Exp. 4. <i>July</i> 24th. Broad-cast.		15	0	0	0
Exp. 5. <i>September</i> sowing on Wheat stubble		0	0	0	0

Oats and Sainfoin.

Agreeable to the instructions already stated, I sowed half an acre of land with ten stone of oats, and two bushels of sainfoin seed—and half an acre with two bushels of sainfoin seed, *without* any corn.

The ground which I chose for the oats, was half an acre, which had been under transplanted lucerne for six years; and as I intended to convert the whole field (19 acres) to other purposes, I was willing to avail myself

self of this opportunity of trying, how far lucerne will improve or impoverish land, for the reception of white-corn.—Accordingly, I ploughed up the lucerne, and on the 25th day of *April*, sowed the half acre of ground with ten stone of oats, and harrowed all fine. —The oats came up very vigorously, and flourished away at a great rate.

On the 16th of *May* there was great rain; on the 18th I sowed over the oats two bushels of sainfoin seed, and bush harrowed.

Adjoining this half acre, in the same field, the ground had been under cabbages—I chose half an acre of this, next to the oats, to sow the sainfoin *without* corn, agreeable to the desire of the Society.—Thus the two experiments for the sainfoin were committed to the ground.

That sown *without* corn, came up so thin, that it required close examination to find the plants; and as sainfoin is very slow the first year, it could make no figure at all, or resistance against its enemies, the weeds, which indeed, rose in such a manner, that I was heartily tired of the experiment, and more ashamed of it, than I can express.—I mowed down the weeds twice, and carried them off by cart loads; they rose again surprizingly, and in short, became so formidable, that nothing was left to be done, but to plough up the ground.

Although it is an idea, which has crept a little way into the world, to sow grass-seeds *without* corn, I presume, from Mr. *Miller* having recommended it in his Dictionary, yet, repeated trials of my own, both in *England* and *Ireland*, with the experience of some of the most spirited Gentlemen farmers that perhaps any age could ever boast of, induces me to condemn the practice, as being inconsistent with first principles, and *unprofitable in an high degree*, reserving only one doubtful exception, which is lucerne; and that I fear, will never become an object of the farmer, until some more compendious method of cultivation for it shall be discovered, than

than that, which, by general consent, and experience, of the most ingenious, seems to be the best—namely, *Transplantation*.

In the experiment before us, of sowing sainfoin *without* corn, there can be no exception taken to the ground in point of quality or capability of feeding plants, for it was in an high degree of perfection, both of richness and culture, and would have afforded almost any crop.——That the land is too stiff in its nature for sainfoin, I have no doubt; but however, from the condition of the ground, if sowing sainfoin *without* corn can answer any good, or profitable purpose, it must have had some success here.

Our other half acre, under the oats, upon the lucerne ground, went on, and made such an appearance, as I had never seen oats to make before; every body who saw, admired them as a crop of amazing luxuriance; but the storms of wind and rain which we had on the 18th, 19th, and 23d of *July*, and several other days, determined the fate of these oats, which really promised to be immense; but this weather laid them down so flat, that they never rose again; and they were so thick, that neither sun or air could penetrate them.——In short, when I came to reap them, the men were obliged to cut where they *could*, all one among another, in the most irregular manner that can be conceived; and drawing out the handfuls of straw stinking rotten.

This putrefaction, carried on to so high a degree upon the surface of the ground, not only destroyed all the sainfoin, but did not leave a weed alive, not even a blade of grass to be seen.

The oats, with great difficulty, were got dry, and thrashed; the produce 5 barrels 9 stone, of long, poor, slokey corn, as ever I saw.——Could the corn have stood, I think, if ever half an acre produced 20 barrels, this would have done it.——As to the straw, there was abundance of it, but in thrashing, it half
tumbled

tumbled to dust, and the remainder was fit for nothing but the dunghill, and not good for that.

One part of our enquiry is pretty fully answered by this experiment; viz. as to the quantity of seed oats. It is very plain, that the land was over seeded, and that where ground is in high condition, less seed will answer, than is generally used or imagined; for, it is the received and established opinion, that, the richer the ground, the more seed must be used; and that, most peremptorily asserted as to oats.—I own, I am inclined to think otherwise.

Why the sainfoin failed in both these experiments, is plain. And although the oats turned out in the manner already described, yet, the event lays open an important piece of information, with respect to the nature, and effect of lucerne upon land, and points out an enquiry well worth pursuing hereafter; for indeed, I had no conception of this piece of ground being in so high a state for feeding plants, as it proved to be, because I had not given it any sort of assistance, in point of manure, for seven years.—In the year 1764, it was planted under potatoes, in the ordinary method of the country, and in *March* following, was furnished with transplanted lucerne, and never received any manure since.

Hence we may expect, that if we can come at any compendious method of cultivating lucerne, that it will certainly contribute to the improvement of dry land, for the reception of white-corn.—I propose to attempt it, and shall begin to prepare a part, if not the whole, of a field for that purpose.—At present, nothing can be poorer than it is, insomuch, that I am sure it has not afforded me ten shillings an acre *per annum* as pasture for eight years, and therefore I have fears about being able to accomplish the whole in my first attempt.—However, I intend to lay the whole process, with the nature and quality of the soil, with some comparative trials upon other grasses in the same field, before the publick, as I proceed, as from what has appeared

appeared in the experiments before us, I conceive it to be an attempt of some moment to mankind.

EXPERIMENTS on CABBAGES.

Variety of Experiments, and considerations on Cabbages.

I have already, so often laid before the publick, my ideas of this species of husbandry, that I shall not repeat them here; it is enough, that I have very strong testimonies that the publick think as I do, because many Gentlemen and farmers, even in this kingdom, have embarked in it; and I know several who have found it so profitable, that they are enlarging their plantations with a spirit, which I flatter myself cannot fail, in time, of making cabbages an article of common cultivation through the kingdom.

In order to preserve clearness in what I have now to offer, I shall adhere to my former method, of dividing my experiments in this husbandry, into two sets, in order clearly to distinguish, what I call the autumn or winter plants, from those which I call the summer or spring plants*.

First set of Experiments on Cabbages, being Winter Plants.

The kinds under culture this year were,

The Anjou Colewort.	} }	The Flat Dutch Cabbage.
The Scotch Cabbage.		The Red Cabbage.

* What I mean by autumn or winter plants, are those, from seed sown in *August*, and the spring or summer plants, those, from seed sown in *March*.

The seeds of these four kinds, were sown in well prepared beds, on the 22d day of *August*, 1769.

On the 30th of *March*, 1770, the plants were put out, in the same ground, which had produced cabbages for two years together before; and they were taken immediately from the seed-beds, without any previous transplanting.—They remained in this state until the 21st of *June*, when I began to horse-hoe them for the first time, and finished on the 23d.—The second, and last hoeing was given on the 16th day of *August*, and finished the 18th.—For the manner of hoeing cabbages, see my Report 1769, page 56.—The plants flourished away at a great rate indeed, and were by much the largest I ever had of the *bard* kind.

The latter end of *October*, I began to use these cabbages for the horned cattle and swine, and they devoured them with the same eagerness, as in former years. In *November*, I found it was necessary to be very liberal in the use of them, for, from the extraordinary wet, and mildness of the weather, I saw the leaves, which were prodigiously large, decaying, and falling off very fast, which was a strong indication, from my former experience, that my *bard* cabbages would not be of long duration this winter; and so I experienced, for the latter end of *November*, there was not an hard cabbage in the field, that had an external leaf left, and many of them of every kind beginning to burst.

This condition of them, obliged me to begin weighing them, which the reader will perceive, must have been at great loss, as the external leaves were totally gone.

November the 28th, one row of the red cabbages, containing 331 plants, weighed 28 C. 0 Q. 13 lb.—Our ridges were 5 feet wide, and 30 perches long.—Our average weight of these cabbages, without any leaves, was 9½ pounds, but I had many that weighed 22 pounds.—Our average distance in the rows 19 inches.

November

November 29th. One row of the *Flat Dutch* containing 326 plants, weighed 29 C. 2 Q. 17 lb. Our average weight per plant, above 10 lb. 3 ounces—many weighed 28 pounds without a leaf.—Our average distance in the rows, about 23 inches, and our ridges 5 feet wide.

November 30th. One row of the *Scotch*, containing 311 plants, weighed 29 C. 0 Q. 7 lb.—Our average weight above 10 lb. 7 ounces—Several weighed 27 pounds without a leaf.—Our average distance in the rows 2 feet, and the ridges 5 feet wide.

The *Anjou Colewort*, I have before informed the publick, sheds its summer leaves, upon the approach of winter.—To come at the probable waste, by not pasturing the leaves in autumn, as I mentioned might be done with sheep, in my last Report, I this year weighed the produce at two seasons—viz. the 27th of *October*, and 5th of *December*.

October the 27th. One row, containing 312 plants, weighed 20 C. 3 Q. 10 lb.—Our average weight above 7½ lb. some so high as 22 lb.—Our average distance 2 feet, and our ridges 5 feet wide.

December the 5th. One row, containing 310 plants, weighed 16 C. 1 Q. 4 lb.—Our average weight 5 lb. 14 oz. some weighed 15 lb.—Our average distance about 2 feet, and our ridges 5 feet wide.

	C.	Q.	lb.	Average. lb. oz.	Largest.
Anjou Colewort, per ridge, <i>October</i> 27th.	20	3	10	7 4	22
Do. <i>Decem.</i> 5th.	16	1	4	5 14	15
Waste in the grofs by not pasturing in autumn.	4	2	6	1 6	per pla. 7 p. p.

C

RECAP-

RECAPITULATION of the produce of the four kinds of Cabbages from each ridge, 630 feet long, and 5 feet wide, with their average and extraordinary weight per plant, all being winter plants.

Cabbages.	No leaves.	Distances.	C. Q. lb.	Average per plant.	Extraordinary plants.
Red	Do.	19½ In. by 5 feet	28 0	9½ 0	22 lb.
Flat Dutch	Do.	23 In. by 5 feet	29 2	10 3	28
Scotch	Do.	2 feet by 5	29 0	10 7	27
Anjou	In October	2 feet by 5	20 3	7 4	22
Do.	In December	2 feet by 5	16 1	5 14	15

I shall now state the acreable produce of these four kinds, and compare the whole with the same kinds of last year, (except the red, of which I had no *winter* plants of that year) cultivated upon the same ground.

We have already seen, that our ridges were 30 perches long, which being multiplied by 21, shews they were 630 feet in length, and being 5 feet wide, we are to multiply our length by the breadth, and our answer will be 3150, which are the number of feet of ground in each of our ridges.—This it to be the divisor

divisor of 70560, which are the number of feet in a plantation acre, and our answer will be 22, and a fraction of 1260 feet, or $\frac{1}{12}$ of an acre.

From this data, we are to form our calculations of the acreable produce of the four kinds of cabbages already mentioned.

The Red Cabbage.—A ridge of these we have seen, afforded 28 C. 0 Q. 13 lb.—which being multiplied by 22, amounts to 30 T. 16 C. 0 Q. To this we are to add our fraction of 1260 feet.—The produce of this plant amounts to about one pound to a foot of ground—Consequently, our fraction of 1260 feet, amounts to 11 C. 1 Q. 0 lb. which being added to the produce of 22 ridges, together, make our acreable produce of the red cabbage, 31 T. 7 C. 1 Q.

The Flat Dutch Cabbage. A ridge of these having afforded 29 C. 2 Q. 17 lb. and being multiplied by 22, amounts to 32 T. 12 C. 1 Q. 10 lb.—To this we are to add our fraction of 1260 feet, which in the same proportion, is something more than 16 ounces $\frac{1}{2}$ to a foot of ground—Consequently, our fraction of 1260 feet amounts to 11 C. 3 Q. 2 lb. which being added to the produce of 22 ridges, makes our acreable produce of the flat Dutch cabbage 33 T. 4 C. 0 Q. 12 lb.

The Scotch Cabbage. A ridge of these we have seen, afforded 29 C. 0 Q. 7 lb. which being multiplied by 22, amounts to 31 T. 19 C. 3 Q.—In this proportion, the produce is a pound and half an ounce to a foot—Consequently, our fraction of 1260 feet, amounts to 11 C. 2 Q. 11 lb. 6 oz. which being added to the produce of 22 ridges, makes our acreable produce 32 T. 11 C. 1 Q. 11 lb. 6 oz.

Anjou Colewort. A ridge of these afforded in October 29 C. 3 Q. 10 lb. which being multiplied by 22, amounts to 22 T. 18 C. 1 Q. 24 lb. To this we are to add our fraction of 1260 feet. The proportion of produce of this plant at this time is above 12 ounces

to a foot of ground; consequently our fraction of 1260 feet, amounts to 8 C. 1 Q. 17 lb. which being added to the produce of 22 ridges, makes our acreable produce 23 T. 6 C. 3 Q. 13 lb.

Anjou Colewort. A ridge of these we have seen afforded in December 16 C. 1 Q. 4 lb. which being multiplied by 22, amounts to 17 T. 18 C. 1 Q. 4 lb. This produce is in the proportion of above 9 ounces to a foot; consequently, our fraction of 1260 feet, amounts to 6 C. 0 Q. 26 lb. 2 oz. which being added to the produce of 22 ridges, makes our acreable produce 18 T. 4 C. 2 Q. 2 lb. 12 oz.

RECAPITULATION of the acreable produce, of the four kinds of Cabbages, the seeds having been sown in the month of *August*, and the plants put out in the spring.

The Table of Acreable Produce.

	1770			In 1769	None this year		
	T.	C.	Q. lb.		T.	C.	Q. lb.
The Red	31	7	1 0				
The Flat Dutch	33	4	0 12		38	11	2 3
The Scotch	32	11	1 11		38	4	0 13
The Anjou in <i>October</i>	23	6	3 13		34	13	0 11
Do. in <i>December.</i>	18	4	2 24				

Here we have at one view; the acreable produce of the four kinds of cabbages before us, with the produce of the same sorts in the year 1769, except the red, and that year I had none of winter plants; and there will ever be found such a difference in point of produce between summer and winter plants, that they must never be compared together.

I have a few pages back, said, that these cabbages were the largest I ever had, and yet we find, that in the general produce, they are all deficient in point of weight, when compared with the produce of the same kinds in 1769. The reader will recollect that the leaves fell off before weighing, which was a great diminu-

diminution of our produce, and therefore, clearly accounts for the difference. The Anjou Colewort indeed is very far deficient of the former year, which to me is unaccountable; unless, its succession upon the same ground be the cause, which I can hardly think. However, we shall be able to form some judgment of this in 1771, as I have planted the same ground again with Anjou Colewort.

The object of duration, I dwelt upon a good deal last year, and gave a clear table thereof in the 73d, page of my Report for that year. This year we find all the *hard* cabbages went off together, much sooner than in the former year. From the 32d. to the 36th. pages of this Report we may state our table of duration for the plants before us, and in comparison for those who may not happen to have the Report at hand, I shall introduce the same plants from my Report of 1769.

Table of Duration.

In 1769.		In 1770.	
No red this year.			
Flat Dutch	} December, and	} November.	
Scotch			
Anjou Colewort	May.	May.	

Here we see a very material difference in point of duration in the two years. A strong lesson to the cabbage farmer, that he is not to rest his whole dependence for winter pasture upon the *hard* cabbage, which we see is so liable to be taken off by mild or wet weather, and still makes a stronger impression upon my mind, of my idea of the cause of the *hard* cabbage not standing with us, as it does in *England*; see my Report 1769, page 69 and 70. Indeed, I am very doubtful, whether what I have hitherto had for the Scotch, has been the true kind. However, I have now got small quantities from five different places in *England*, and we shall be able to form a judgment from them, whether *this* kind of *hard* cabbage will stand with us or not.

Indeed,

Indeed, I did not get the seeds time enough, to sow them as autumn plants, and therefore they were all sown in spring 1771, the success of which, the publick may expect a very particular and exact account of in my next Report. In the mean time, this circumstance of the *bard* cabbages going off so much earlier this year than in the former, induces me to recommend to the consideration and close attention of the cabbage farmer, my table of successions in my Report for the year 1769, page 110.

THE SECOND SET OF EXPERIMENTS upon Cabbages, being the spring or summer Plants.

The Kinds were as follow.

- N^o. 1. The flat Dutch Cabbage.
2. The Green Savoy Cabbage.
3. The large Scotch Cabbage.
4. The Turnip Cabbage.
5. The long sided Cabbage.
6. The Turnip rooted Cabbage.
7. Green Boorcole.

Here we have seven kinds, of which I sowed the seeds on the 2d of April 1770. On the 29th of June we had fine rain. On the 30th I planted out of the preceeding kinds in the following order, ten perches in length, with the most minute exactness that could be, in a field, five acres of which was also planted afterwards with the same kinds.

N^o. 1. Flat Dutch.

N^o. 1. 11 feet by 4 feet 10 perches 210 plants.
2. 18 inches by 4 feet 10 Do. 140 Do.
3. 2 feet by 4 feet 10 Do. 105 Do.

N^o. 2.

N^o. 2. Green Savoy.

N ^o . 4	1 foot by 4	10 perches	210 plants.
5	18 Inches by 4 feet	10 Do.	140 Do.
6	2 feet by 4	10 Do.	105 Do.

N^o. 3. Scotch.

7	1 foot by 4	10 Do.	210 Do.
8	18 Inches by 4 feet	10 Do.	140 Do.
9	2 feet by 4	10 Do.	105 Do.

N^o. 4. Turnip Cabbage.

10	1 foot by 4	10 Do.	210 Do.
11	18 Inches by 4 feet	10 Do.	140 Do.
12	2 feet by 4	10 Do.	105 Do.

N^o. 5. Long Sided.

13	1 foot by 4	10 Do.	210 Do.
14	18 Inches by 4 feet	10 Do.	140 Do.
15	2 feet by 4	10 Do.	105 Do.

N^o. 6. Turnip Rooted.

16	1 foot by 4	10 Do.	210 Do.
17	18 Inches by 4 feet	10 Do.	140 Do.
18	2 feet by 4	10 Do.	105 Do.

N^o. 7. Boorcole.

19	1 foot by 4	10 Do.	210 Do.
20	18 Inches by 4 feet	10 Do.	140 Do.
21	2 feet by 4	10 Do.	105 Do.

The reader will plainly see, what were the questions to be ascertained by these experiments—viz. distance for planting, and duration. Having those two points in view, I did not suffer the plants to be touched until the 5th of April 1771. On that day, their weight was examined, they having been horse-hoed during the preceding summer, with the rest of the field, in all five acres under cabbages. This ground had produced cabbages the year before, 1769, and had no additional dressing of manure.

N^o. 1.

71
26
45

Experiments on Cabbages.

N^o. 1. Flat Dutch.

		C. Q. lb.			
N ^o . 1	1 foot by 4	4	2	2	
2	18 In. by 4 feet	3	2	12	
3	2 feet by 4	3	0	20	
					} Several Run, and others decayed.

N^o. 2. Green Savoy.

4	1 foot by 4	3	1	18	} Several run, and some decayed.
5	18 In. by 4 feet	2	0	24	
6	2 foot by 4	2	2	8½	

N^o. 3. Scotch.

7	1 foot by 4	3	1	12	} Several run, and others decayed.
8	18 In. by 4 feet	3	0	16	
9	2 feet by 4	2	2	24	

N^o. 4. Turnip Cabbage.

10	1 foot by 4	2	0	12	} Some Rusty, but all sound.
11	18 In. by 4 feet	2	1	6	
12	2 feet by 4	1	3	20	

N^o. 5. Long Sided.

13	1 foot by 4	0	0	0	} In a manner, all melted away.
14	18 In. by 4 feet	0	0	0	
15	2 feet by 4	0	0	0	

N^o. 6. Turnip Rooted Cabbage.

16	1 foot by 4	4	2	18	} All sound. Very small tops.
17	18 In. by 4 feet	3	0	19	
18	2 feet by 4	3	0	6	

N^o. 7. Green Boorcole.

19	1 foot by 4	2	3	4	} All sound, and growing fast.
20	18 In. by 4 feet	2	1	20	
21	2 feet by 4	2	0	26	

Before

Before I make any observations upon this set of experiments, I shall calculate the acreable produce, from the above proportions, as the quantity per acre, strikes the imagination with a clearness, which fractions of acres cannot convey.

		T.	C.	Q. lb.
No. 1. Flat Dutch.				
No. 1.	1 foot by 4 per acre	18	19	2
2.	18 inches by 4 feet ditto	15	3	
3.	2 feet by 4 feet ditto	13	7	

No. 2. Green Savoy.				
4.	1 foot by 4 feet ditto	14	6	2
5.	18 inches by 4 feet ditto	9	6	
6.	2 feet by 4 ditto	10	16	1 14

No. 3. Scotch.				
7.	1 foot by 4 ditto	14	2	
8.	18 inches by 4 feet ditto	13	4	
9.	2 feet by 4 ditto	11	8	

No. 4 Turnip Cabbage.				
10.	1 foot by 4 ditto	8	17	
11.	18 inches by 4 feet ditto	9	13	2
12.	2 feet by 4 ditto	7	18	2

No. 5. Long-Sided.				
13.	1 foot by 4 ditto	0	0	0
14.	18 inches by feet ditto	0	0	0
15.	2 feet by 4 ditto	0	0	0

No. 6. Turnip Rooted.				
16.	1 foot by 4 ditto	19	11	2
17.	18 inches by 4 feet ditto	13	6	1
18.	2 feet by 4 ditto	12	16	2

No. 7. Green Boorcole.				
19.	1 foot by 4 ditto	11	14	
20.	18 inches by 4 feet ditto	10	4	
21.	2 feet by 4 ditto	9	7	2

Here

Here we have the acreable produce of these seven kinds, at their respective distances, which I do not lay before the publick, as being inviting in point of quantity, for that is small in my estimation; for which, there are several ways of accounting—amongst others, the ground not being in very high condition for the growth of cabbages, it having produced a crop the year before—some of the plants quite decayed, and others in a languid state, by keeping them over so very late, to come at the point of duration.—Perhaps the insufficiency of the ground to produce large and vigorous cabbages of the hard kind, was the very reason that any of them stood so long, for it may be remembered, that I have always had them burst much earlier, when they have been large; and I own, from the repeated tryals which I have made, that I very much fear, no hard cabbage will be able to stand in this country to any good purpose, much longer than Christmas; but before, and till then, very considerable advantage will arise to the landholder, from a judicious culture of them.

The two questions principally sought after in this set of experiments, are answered pretty satisfactorily, though I think not conclusively. First, as to the distances.—We see chiefly, that, as the distances increase, so our produce diminishes, with only two exceptions—viz. No. 6, although two feet distance, exceeds No. 5, at eighteen inches, 30 hundred, and No. 11 exceeds No. 10, the distances of one foot eighteen inches, 16 hundred. Variations which may arise from different causes, and which are unavoidable in pursuits of this kind.—And in the present case more likely, from the determined object, to let these plants stand through the winter, even though they had all perished thereby because, even that would have afforded us useful information.—But in general, we see, through this whole set of experiments, that the one foot distance has produced the greatest quantity, with only one exception to the contrary No. 10, and 11.—A strong indication of my having hitherto taken too great a distance, as I suggested in my report of last year.—However, let it not be forgotten, that greater distances must always be taken for

for winter, than for summer plants, and for ground naturally rich, than for that of inferior quality; and perhaps my table of distances, both for summer and winter plants, in my report for 1769 page 114, may be found to answer pretty well, though I request the reader will remember that I am not peremptory in the framing of that table.

Our second question in this set of experiments, was the duration of the kinds here chosen.—We see they all produced something, even after letting them remain until *April*, except the long sided.—But all the hard kinds would certainly have weighed more, had they been cut in *November*.—However, the turnip cabbage No. 4, the turnip rooted cabbage No. 6, and the boorcole No. 7, by this set of experiments, seem to be the only kinds, which are to be depended upon in spring; as all the hard kinds appear to be precarious, and therefore, to depend on them at that season, might be very hurtful to the farmer or grazier.

It is true, upon the face of the table of acreable produce, page 41 the turnip cabbage and boorcole, produce less than the precarious kinds, but there certainly is satisfaction in safety, for of these we are sure even in the latest hour in the spring, whatever the quantity may be, because no weather can destroy them.—Besides which, the boorcole will every day improve, until it is in full blossom, which I find in general, will not happen until late in *May*,—the quantity of that being so small in our table of acreable produce, may be safely charged to its being cut, before the spring growth had made any great head.

We see that the turnip rooted cabbage exceeded all the rest in point of produce, which is certainly a great fact gained, and therefore demands the particular attention of the sheep-farmer; as, for any other stock, I conceive it to be a mere nothing.

The principal merit of this plant is in the root.—The objection to it is the labour in getting it up, which cannot be done, without a mattock, or a very strong
three

three pranged fork.—I had about an acre of it this year, and I was obliged to take that method of raising the plants out of the ground.

I had no sheep, and therefore I had them brought home to the cattle in the yard.—They worked at them, and seemed to be fond of them, for their flavour is agreeable, they are juicy, (though not watery) and I am convinced feeding, but so hard, that the cattle must be habituated to these kind of pastures to eat them—mine did, but the hardness made their mouths bleed, and there was very great waste.—And therefore, where they are grown in quantity for cattle, I should recommend their being chopped with an axe or cleaver into slices, which perhaps, may make them profitable in feeding fat cattle late in the spring, but they should be washed before chopping, as from their infinity of fibrous roots, they bring up a great deal of dirt with them.

It will be unnecessary for me to enlarge upon the state of the several plants in this set of experiments, since the table in page 40, shews the whole at one view.

The five acres under cabbages in this field, were all used for cattle, and swine, as the former year, and answered exceeding well, only that our produce was not so plentiful, as in the former year.

EXPERIMENT ON DRILLED WHEAT.

In my report 1768, page 28, after several reflections, laying before the publick the objections which I have experienced to this cultivation of wheat in successive crops upon the same ground, I suggested that perhaps it might be profitable to sow wheat under the harrow, after the *first* crop of drilled wheat.

That I might be able to lay this before the publick with more certainty, than mere matter of reflection can afford, I was determined to put it in practice in a pretty extensive way, in order to have the exhibition large,

large, for the inspection of such gentlemen and farmers, as should come and see it.

To this end, I prepared by fallow, *twelve* plantation acres, and drilled them with common white wheat, on five feet ridges, from the 9th to the 14th of *October*, 1769. The quantity of seed *five* stone and *four* pounds per acre. The land, a kind strong loam, constantly under tillage, and I believe never received any manure.

The corn came up very well—was three times horse-hoed, and the strongest weeds taken out. The crop made a pleasing and promising appearance; and I did imagine, would have turned out much more prolifick, than it proved to be.—But it was a good deal smutted, and suffered prodigiously on the north side of the field from the sparrows, where they had a large full grown hedge to lodge upon.—What the smut was owing to, I shall not pretend to determine, as, in my former reports, I have laid before the publick, my sentiments upon that disease, to which all white-corn, and wheat in particular, is liable—I shall only just remark, that we had a good deal of *rain*, much *bazy* weather, and the wind chiefly at *west* in *July*, attended with *cold*, all which, I have, repeatedly observed to be very hurtful to the wheat in this country.—Whether these are the causes which produce the smut, and other diseases upon wheat, I shall not say; but for my reflections upon it, I beg to refer the reader to my reports of 1764 and 1768.

Dr.

Dr. DRILLED WHEAT THE LAND-TYTH FREE.

	l.	s.	d.
1769 To ploughing 12 acres 4 times at 10s.	24	0	0
To harrowing ditto 3 times at 2s	3	12	0
T drill harrowing at 4 $\frac{1}{2}$ per acre	4	6	
To drilling the seed-corn	8	6	
To seed-wheat 3 bar. 3 ft. 6 lb.	3	3	5
To rent for the year of fallow at 18s.	10	16	0
To county less	14	5	
1770 To three horse-hoings at 20d per acre	3	0	0
To weeding	0	9	0
To reaping and binding	1	19	0
To drawing home, and putting in the barn	0	18	0
To rent for the year of growth	10	16	0
To the county less	0	12	0
To thrashing and winnowing 53 bar. 4 ft. at 12d.	2	13	2
	63	6	0
To net profit	17	5	3
	80	11	3

12 ACRES per PRODUCE Cr.

1770 By produce of wheat 53 bar. 4 ft.

at 25s.

By straw 93 load 3 hundred at 3s
per load or 90 per hund:

1. s. d.

66 10 0

14 1 3

80 11 3

12/53/4 6 near 1/2
40
5

1 19 0
10 0

2 19 2

12/110/9
100
2

12/171/14
82
58
3

Here we have a profit of £ 17 5 3 upon twelve acres which is £ 1 8 9 $\frac{1}{4}$ per acre.—A profit, which, in my estimation, is not to be boasted of, after two years labour; and yet, I wish every crop of fallow-wheat in the kingdom would produce as much.—In the present case, and from the small produce, I own I expected, upon stating the account, that there would have been loss, because, the expences of preparing fallow, even *without* manure, will ever be great.—The profit before us, coming out, upon the first crop, is favourable to the present enquiry.—And in order to carry it on, I have sown the same ground with wheat, under the harrow; and in my report for the year 1771, I will lay before the publick, the result, of that continuation of the experiment, and then bring the whole into one view; by which, we shall be able to form a pretty clear judgment, how far the drill husbandry will be capable of rendering land fit for such a succession of wheat crops; and therefore, as the principal object of the experiment is yet depending, I shall dismiss this subject for the present.

Some account of the SUMMER maintenance of *Horned-cattle, Horses, and Swine, upon Broad-Clover.*

In my report for last year, 1769, I was pretty full upon this subject.—The field devoted to the purpose was twelve acres.—I beg to call upon the attention of the reader with respect to this field, because it will be the subject in my report 1771, of a culture, so interesting to the farmer and the community, that it cannot be too much attended to.

My report for last year, shewed how the clover of this field was disposed of; the stock it maintained, and how long, with the manner of using the clover. From necessity, and not from choice, I was obliged to continue it under clover this year 1770.—As I despaired of the ground being in sufficient vigour to afford a mowing crop the *second* year, I pastured it.—Though I believe, contrary to the received opinion, that where land is in good condition, clover will mow to profit,
even

even the *second* year, but I will ascertain this fact next year, of which the publick shall receive information, in my report for that year.

I shall now lay before the reader, the stock which this field maintained last summer.

On the 27th day of *April*, eight horses were turned into this field, and remained there until the 13th of *June*.

On the 8th day of *May*, forty-three pigs were turned in, and remained there, until the 13th of *June*.

On the 9th day of *May*, four large plough bullocks were turned in, and remained there until the 13th of *June*.

On the 12th day of *May*, four milking cows were turned in, and remained there until the 13th of *June*.

On the 13th day of *July*, eight horses were turned in again, and remained there until the 23d of *August*.

On the same day, four large plough bullocks were turned in, and remained there until the 16th of *August*.

On the same day, forty-three pigs were turned in, and they remained there until the 27th of *September*.

Produce of this field by grazing in the summer 1770.

To eight horses, from the 27th day of <i>April</i>			
to the 13th day of <i>June</i> , being 47 days, at	l.	s.	d.
5d per horse per day	7	16	8
To 43 pigs, from the 8th of <i>May</i> , to the 13th			
of <i>June</i> , being 36 days, at 1d per pig per day	6	9	0
To four plough bullocks, from the 9th of			
<i>May</i> , to the 13th of <i>June</i> , being 35 days,			
at 3d per day per bullock	1	15	0
To four milking cows, from the 12th of <i>May</i> ,			
to the 13th of <i>June</i> , being 32 days at 3d.			
per cow per day	1	12	0

D

17 12 8

50 Maintenance of Horned Cattle, &c.

	£.	s.	d.
Brought over	17	12	8
To eight horses, from the 13th of July, to the 23d of August, being 41 days, at 5d. per day per horse	6	16	8
To four plough bullocks, from the 13th of July, to the 16th day of August, being 34 days, at 3d per bullock per day	1	14	0
To 43 pigs, from the 13th of July, to the 27th day of September, being 76 days, at 1d per pig per day	13	12	4
	39	15	8

The sum total of this account, I own, astonishes me; and shews, that the *pasturing* of ground affords such profit, as would induce me, instantly, to hide this account for ever from the publick, lest it might contribute to the injury of *tillage*, had I not *that important object* in sight, in the subject before us. The amount of this pasturing so surprises me, that it has determined me for ever hereafter, to keep an accurate account of the number, and kind of cattle, I may turn into any field upon my farm, and the time they remain there.

Perhaps, some may imagine, that I have valued the pasturing of this stock too high. Fearing that, was the very reason, which prevented my putting some price upon the stock, which this field maintained last year; but several Gentlemen having expressed their wish that I had done it, and that I now find it is necessary I should, because this field will afford matter hereafter, which I promise myself, will be interesting to the publick, because I hope it will be instructive and profitable to the farmer.

As to the prices just stated, I conceive *five* pence a piece for horses to be very moderate, *three* pence for a plough bullock, I apprehend to be full low enough, and *three* pence for a milking cow, during the summer months

12/48/3
36/1
4

= 10 3.4 0 pence

months, I apprehend, cannot be called dear; but any reader who may have exceptions to these charges, can easily state the account at what price he pleases, for his own information. As to the swine, I am not so clear about: I think *one* penny per day is full low, and yet, from the value of the swine, I think the price high enough; for, in putting a value upon the pasturing any stock, if we charge more than the improvement of the beast is worth, or more than the labour of working cattle is worth, we should certainly charge too much. No man will think the labour of the horse (particularly such as mine, which are strong able cattle of a good price) worth so little as *five* pence per day, or that of the plough bullock at *three* pence; and as to the cows, they are surely cheap at *three* pence; for if we value the milk at *one* penny a quart, it must be a poor cow indeed, that does not pay more than the pasture, since, from *six* to *twelve* quarts and upwards, is very frequent for a cow to give in the summer months.

As I intend the field before us, to go on in a constant succession of crops, without intermission, (somewhat similar to what I have proposed to the Society by way of premiums, in my *Practical Agriculture Epitomized*) for the information of the publick, until I find a check, by it's failing in produce, I shall now, not only put a price upon the stock it maintained last year, but also remind the reader of the crops it has produced for some years, *without intermission*; and I hope the size of the field, will be a strong confirmation to the reader, of the impossibility of its being favoured in any respect by manure, of which it has received none, since the summer 1765, save about six acres, at the poorest end of the field, which was dressed with the potatoe compost, in the winter 1770, from a ridge of potatoes which run the whole length of the field the year before, upon the north-east headland, and of which, the proper charge will be made presently, in the general account of loss and gain.

- In the year 1766, Under various Experiments.
 In the year 1767, Under Wheat.
 In the year 1768, Under Oats.
 In the year 1769, Under Clover, mowed for cattle, as mentioned in my Report of that year.
 In the year 1770, Under Clover, grazed, as just mentioned.
 In the year 1771, Now under Wheat.

An Account, and value, of the maintenance of the Stock, which this field supported in the year 1769, by grazing a part, and mowing the remainder of the clover, as described in my Report for that year.

	£.	s.	d.
By maintaining 83 head of swine, from the 24th day of May, until the 26th day of August, being 94 days, at 1d. per head per day	32	10	2
By maintaining 9 horses, from the 10th of May, to the 6th of June, by grazing 2 acres which were intended for seed, 27 days, at 5d. per head	5	1	3
By maintaining nine horses, from the 6th of June, until the 29th of September, being 115 days, at 5d. an horse per day	21	11	3
By maintaining four plough bullocks the same time, at 3d.	5	15	0
By maintaining three milking cows the same time, at 3d. each per day	4	6	3
Carried over	69	3	11

3/7-1

20/5:15:0
 20
 100/15

Brought over

£.	s.	d.
69	3	11

By maintaining 31 head of running stock the same time, which I shall charge only at *one penny* per head upon an average, as it may be remembered, they run upon a common in the day time

14	12	1
----	----	---

83	16	0
----	----	---

By eight load of clover hay

2	0	0
---	---	---

£ 85	16	0
------	----	---

As I intend to bring this field into my Reports every year for the future, I shall now state the account Dr. and Cr. for the two past years; and it is with particular concern that I cannot, at present, state the expence and produce of the preceding years; but against my next Report, or perhaps before I print this, I will look over my accounts, to see whether I can ascertain those points with that exactness which I wish to lay them before the publick, and which I might do immediately, were it not for some causes, which I shall avoid to trouble the reader with.

In the form in which I now mean to lay this field before the publick, I think it necessary to describe the quantity of ground exactly; and upon looking at the map of my farm, I perceive I have made a mistake in calling the field 12 acres, in my last Report; that idea has been so strong upon my mind, from the tillage part I suppose being thereabouts, that I could not have looked at the map. I now find the gross contents to be 13 A. 2 R. 18 P. However, as the field is now circumstanced, there will be a good deal of waste ground, from a corner of grass, two broad headlands, ditches, &c.

Dr

12

85/7
84
1

Dr. The Field, No. 10, in my present Map,

	£.	s.	d.
1768. To Cash by Clover seed, 2C. 1Q. } at 3 <i>l.</i> - - - - - }	6	15	0
To sowing, bush-harrowing and rolling - - - - - }	11	0	
1769. To picking the stones in heaps, by task, cost (too dear) - - - }	1	13	4
To drawing them off, for drains in other fields - - - - - }	1	8	11½
To a man mowing and drawing home clover 94 days, at 8 <i>d.</i> - }	3	2	8
To an horse drawing home the clover 94 days, at 1 <i>s.</i> - - - }	4	14	0
To mowing and making 8 load of hay, at 1 <i>s.</i> - - - - - }	8	0	
To mowing, and struggling to save 2 acres for seed - - - - - }	18	0	
To repair of fences - - - - - }	12	0	
To one year's rent of 13 A. 2 R. 18 P. at 18 <i>s.</i> - - - - - }	12	5	0
To county Cess, for this field's proportion - - - - - }	14	5	
To drawing out the dung for 60 perches of potatoe ground upon the north-east side, for men and horses - - - - - }	11	0	
To men for planting the potatoes	12	0	
To seed potatoes, 30 stone	15	0	
To digging the potatoes	18	0	
To ploughing and harrowing the potatoe ridge, to mix the manure }	2	7	
To filling and drawing out the manure upon 6 acres - - - }	4	18	0
To spreading ditto - - - - - }	1	4	0
To bush-harrowing and rolling	6	0	
	42	8	11½
To net profit in 1769	49	7	0½
	£ 91	16	0

13 Acres, 2 Roods, 18 Perches.

Cr.

	£.	s.	d.
1769. By maintaining the stock, as stated in the 52d page - - - - -	83	16	0
By eight load of clover hay, at 5s.	2	0	0
By 2 acres for seed, totally lost by rain - - - - -	0	0	0
By potatoes from the headland.—I have not a distinct account of the exact produce, but they were very good, and the ridge was broad, and therefore I think I may safely value them a barrel to 3 perch -	6	0	0
	£	91	16 0

* The charge for keeping the wine is better than the
beyond doubt, how much more expensive it is to have one
tence and some instances, than in the most capital cities.
It is the interest of the wine at a low price. Now, if
even that was laid out to render the lower and higher
percentage, calculation will show how the saving the expense
of water would be in interest. The at year of each ex-
pende, would make it £20 per Cent. the 5s. and is
on. By this reasoning, which how long, even very heavy
expenses in improvement will be repaid. To be laid, be
the larger fund, must think to repaid the
which, in expense, will be very small. This is the
of the longer, more to even build a great

$$\begin{array}{r}
 300 \\
 800 \\
 12 \overline{) 90466} \\
 \underline{360} \\
 54466 \\
 \underline{48000} \\
 6466
 \end{array}
 \quad
 \begin{array}{r}
 75 = 3.15 \\
 10 \\
 13 \\
 27.01
 \end{array}$$

Here we see a net profit comes out of £49 7 0, (even after such very heavy charges,) which is £3 12 5 per acre. I should imagine, we need nothing stronger, to recommend clover to the attention of the farmer. I own, for my part, I had no conception that it could afford such prodigious credit, much less such profit, after the heavy expences which I brought upon it. Picking and drawing off the stones, is an enormous weight upon the profits, to which other land may not be liable. They were so thick in a part of this field, as to lie one upon another, and will be a constant expence for some years, as at every ploughing they will rise; but I will persevere, by which, I do not despair of banishing this intruder; and surely there must be pleasure in the pursuit, when we see the expence is repaid as we go on.

Dr. The same Field, No. 10, in my present Map.
1770.

	l.	s.	d.
To a boy keeping the swine 112 days, at 4d.*	1	17	4
To a man mowing weeds 7 days, at 8d.		4	8
To repair of fences		10	0
To one year's rent of 13A. 2R. 18P. at 18s.	12	5	0
To county Cess this year		13	1
		15	10 1
To net profit		24	5 7
		£39	15 8

* This charge for keeping the swine is heavy, and shews, beyond dispute, how much more expensive it is to have our fences and gates imperfect, than in the most capital order. £1 17, is the interest of £37 at 5 per Cent. Now, if even that sum were laid out to render the fences and gates permanent, calculation will shew how the saving the expence of *tenders* would rise in interest. The 2d year of such expence, would make it £10 per Cent, the 3d £15, and so on. By this reasoning, we see how soon, even very heavy expences in improvement will be repaid. To be sure, he who has not the larger sum, must submit to expend the smaller, by which, *his* expences will be greater, *very much greater*, than those of the stronger man. This is the destruction of all poor people in every pursuit.

By Produce

1770.

By produce, as stated in page 42

Cr.

l. s. d.

39 15 8

£39 15 8

By

By net profit in the year 1769	£49 7 0½
By net profit in the year 1770	24 5 7
Total profit of two years	<u>73 12 7½</u>
Average per an.	£36 16 3½
Average per acre per an.	£2 14 0
By net profit in the year 1769	£49 7 0½
By net profit in the year 1770	24 5 7
Net profit greater the first year than the 2d by	25 1 5½
Net profit in the year 1769 per acre	£3 12 5
Net profit per acre in 1770	1 15 7
Net profit per acre greater the 1st year than the 2d by	<u>1 16 10</u>

These strike me, as being important facts. The acreable profit in each year, in my mind, is very great, and I am sure such, as the tillage acres through the kingdom cannot come near.

But the great difference in the two years, opens a tempting field for enquiry; *viz.*

Whether it is worth while, to let the clover stand for the second year, notwithstanding the profit is considerable?

Whether it is more profitable to plough it up at *Michaelmas*, after mowing the clover twice, and to throw in wheat?

Or whether more profitable to pasture the second year? Or whether, upon a fair comparison, the clover will yield most profit by grazing or mowing?

Whether best for wheat after grazing or mowing? And if grazing shall be most profitable, what kind of flock is most advantageous to pasture upon it?

These,

These, with several other important enquiries, strike me at present, and I shall endeavour to pursue them, as being of the greatest moment to the farmer and community.

Having more than once, in the course of my relation of this field, mentioned my intention, of continuing it under a succession of crops, for the view, and information of the publick, and that consequently it will, every year hereafter, have a place in my Reports, I shall here give an account of the process and expence of putting the crop in the ground, which the field now carries.

The reader will observe, that on the 29th of *September*, 1770, this field *stands clear of all expences*, as by the account stated in page 56, and that, in that account, a charge has been made of mowing the weeds, which was to prevent their running to seed, to the annoyance of the succeeding crop.

I have frequently mentioned to the SOCIETY, the vast expence it is to the farmer, to prepare land by fallow, for the reception of wheat; and, that clover-lays, *properly* managed, will produce excellent crops of that grain: many Gentlemen and farmers, have frequently heard me urge the same; and to many of both who visited me last summer, I told my intention of sowing the field before us, with wheat at *Michaelmas*. —Several of them retained this declaration upon their minds, and have held the success so doubtful, that they have come this summer, 1771, to look at the wheat, which I own I have had great pleasure in shewing*.

* The reader will indulge me here with this remark; that this very event, of people coming in a second year, to see a species of culture carried into execution which they held doubtful of success, shews clearly, the publick utility of carrying on experiments in this manner.

I shall

I shall not here give any account of the crop, that will have a place in my next Report, but I shall now lay before the reader, the account of expence in committing the seed wheat to the ground.

Dr. Wheat Seeding 1770, in Field, No. 10. on Clover-Lay 2d year, mowed twice the *first*, and grazed the *second*.

1770. Sept. 28, to October 26th, To nineteen ploughs and half, at four shillings a plough per day; one with <i>four</i> horses, and the other <i>four</i> bullocks	l. s. d.
	3 18 0
To two ploughmen, nineteen and half days, at ten pence per day.	0 16 3
To twenty harrows, two horses in each pair, at two shillings.	2 0 0
To a boy twenty days driving do. at four pence	0 6 8
To the seedsman for sowing the seed	0 4 5½
To seed wheat, 5 bar. 12 ft. ½, at twenty-five shillings per bar.	7 0 7½
To labourers for water-cutting the field	1 11 5
To shoveling about an acre and half, at the wet end of the field	0 3 11½
	£16 1 4½

It perhaps may be a matter of surprize, that I should be, from the 28th of *September*, to the 26th of *October*, sowing this ground; but it was for a reason, which renders *this* sowing of wheat particularly happy; for, when rain came, we were obliged to quit the fallow sowing, and return to this, which we could proceed with, when we could not, or rather, must not stir upon the fallows; so that, this field was rather kept as a standing business, which might go on, when the other could not; a circumstance which I own, did not occur to me, until experience pointed it out:—At the same time, it will hardly be imagined, that even

even *this* can be done in an husband-like manner, when *very heavy* rain falls; but what I would be understood to urge is, that it can be entered upon much sooner after heavy rain, than fallow can, and I have reason to believe, from the appearance of the corn, will produce at least as good, if not a better crop, upon ground of equal quality.

In the progress of this business, I made it a point to finish sowing every evening, what was ploughed in the day, otherwise, heavy rain would have made the ground greasy, and thereby have interrupted this sowing, as well as that on fallow; and therefore, to whoever shall adopt this culture of wheat, I recommend particular attention to that circumstance:—At the same time they will find that some rain will be necessary before they begin to plough up the lay, to make the ground rise kind and mellow, and by letting the seedsman follow the plough, and the harrows the seedsman, the ground will harrow brittle and kindly, and most completely cover the seed.—And therefore, if the ground be dry, and of a strong kind, it will be prudent to wait for a little rain, otherwise the sod will rise strong, and consequently not *crumble* from the plough, which (to crumble) is the criterion of fit condition for the harrow, and thereby, great interstices will be left by the sods, standing too erect, and the seed falling therein, will be over covered.—In that case, one brush of the harrows should precede the seedsman.—A few of my ridges were in this way, and I pursued that method, and found it prudent and useful.

As we finished sowing, I caused one of the ploughs to return to the furrows, and throw up one sod out of each, which left all the furrows clean, to admit the water to pass freely into the water-cuts; which, by the sum charged for that part of the work, the reader will imagine was done pretty spiritedly.

In the sowing this wheat, I pursued a method, which I never practised before, but I never shall depart from it again, since I find how much moment it is of; namely this.—I was determined to be very accurate in

in the quantity of seed to be sown in all my wheat fields this year, and therefore I took off the length and breadth of each from my map, making allowances for ditches, and other waste ground; calculated how many perch along the headlands would make an acre across the field, and gave the seedsman a measure and pegs to lay out each acre; and in each sack, gave him ten stone of seed, and no more, for each acre; not attending minutely to any little variations, which the bevel, or other small irregularity of the field, might create; so that I cannot pronounce at present with minute exactness, how much of the ground is under corn, but I will have it accurately surveyed, against I come to give further particulars in my next Report.

We have seen, that the total expence of getting this wheat into the ground, including seed, and that at 25s. a barrel, workmanship, and cattle of every kind, amounts to no more than £16 1 4 $\frac{1}{2}$.—If there are *twelve* acres under corn, which I suppose to be about the matter, it amounts to £1 6 9 $\frac{1}{2}$ per acre.

If the reader will be so kind, as to turn to the 55th page of my Report for the year 1765, he will find the expence of cultivating wheat in the ordinary method by fallow, to be £5 7s. per acre, including the year's rent for fallow, and the rent for the year of growth.—Let us deduct 18s for the latter, and the charge of putting the wheat in the ground will be £4 9.—In that case, the 12 acres before us, would have cost £53 8.—Let us examine the difference.

To sowing 12 acres of wheat, by the fallow	l. s. d.
preparation, without any manure	53 8 0
To sowing 12 acres on clover-lay	16 1 4 $\frac{1}{2}$
	£37 6 7 $\frac{1}{2}$

Here we see, that the fallow preparation amounts to £37 6 7 more than the clover-lay, upon twelve acres of wheat, when it is got in ground.

This

This is immense to the tillage farmer; but let us trace the difference yet farther, which the subject before us clearly admits of.

By a fallow preparation for, and sowing *twelve* acres of wheat, the *fallow* farmer incurs an expence of £37 6 7 more than the other with his clover preparation, and sowing the same quantity of ground will cost.—Whilst the fallow farmer is preparing the fallow, at great labour and application, and consuming an whole year in the doing it, the clover farmer is making a profit upon the ground which *he* intends for wheat—of, if we take the first year £3 12 5 per acre.—If we take the average of the two years.—of £2 14s.—And if we take the last year, of £1 15 7.—I shall premise, that at present, I do conceive it the best way to sow wheat after mowing the clover twice the *first* year.—Now, in order to state the comparison fairly between the *two preparations*, we have a right to add the clover farmer's gain, to the fallow farmer's loss, because there is clearly that difference in the expence of the two methods.

First state of the case.

The fallow farmer, in preparing twelve a-	l.	s.	d.
crees of land for wheat, incurs a greater	}	37	6 7½
expence, when his sowing is finished,			
than the clover farmer by			
The clover farmer, in preparing his ground	}	43	9 0
for wheat, if the <i>first</i> year, gains upon			
twelve acres			

Total difference on 12 acres £80 15 7½

Second

Second state of the case.

The fallow farmer, in preparing twelve
acres of land for wheat, incurs a greater
expence, when his sowing is finished,
than the clover farmer } l. s. d.

37 6 7½

The clover farmer, in preparing his ground
for wheat, if we take only the average
of two years clover before stated, gains
upon twelve acres } 32 8 0

Total difference on 12 acres £ 69 14 7½

Third state of the case.

The fallow farmer, in preparing twelve
acres of land for wheat, incurs a greater
expence, when his wheat sowing is finished,
than the clover farmer, by } 37 6 7½

The clover farmer, in preparing his ground
for wheat, if we take only the profit, e-
ven of the last year, gains upon 12 acres } 21 7 0

Total difference on 12 acres £ 58 13 7½

The *first state* of the case, makes a difference in
the expence per acre, of £6 14 7½.

The *second state* of the case, makes a difference in
the expence per acre, of £5 16 2½.

And, the *third state* of the case, makes a difference
in the expence per acre, of £4 17 9½.

Thus I have stated this difference in the three ways,
which the preceding accounts admit of, for the fullest
satisfaction and information of the reader.—If any one
shall imagine the first state of the case too high, where-
by the difference appears to be £6 14 7½ an acre,
I shall be allowed to think the third too low, and
therefore

therefore, what seems to be the unerring proportion, is the second state of the case, whereby the difference is £5 16 2½ an acre.—So that it is manifest, that the fallow preparation must produce more wheat by £5 16 2½, than the clover-lay, to be upon an equality.—This I think is the clear result of the question before us.—What fallow upon earth, the land being of equal quality in both cases, can come up to that, I must submit to the fallow farmer to find out.

Wheat is certainly the most important, because it is the most valuable grain upon earth.—The common manner of cultivating of it is slow, and expensive to such a degree, that I am persuaded half the wheat which is grown in the kingdom, stands the farmer in more than he sells it for, were he to charge his own labour, and that of his cattle.

A cheaper preparation for it, than that of fallow, is therefore wanting.—Clover, I look upon it, affords one happy method; there are several other articles within the farmers department, which I imagine will also contribute to this great and fundamental support of mankind, upon which, I shall proceed to make proper trials before I say more about them, than I have done in my introductory paper to this work, and in my *Practical Agriculture Epitomiz'd*.—How the wheat on the clover-lay, now depending, will produce I can say nothing to at present; but the crop is of such kind, that I only wish every farmer in the kingdom, to see it at this hour; as it is an *even, clean, fair* crop, which I own I am not a little proud of.

I shall for this year, close upon this subject; and only presume to wish the Society to consider the importance of the object, to the farmer, and the community; as I really think, for an infinity of reasons which might be offered, they could not direct the liberality of their institution, to any object of more *immediate* consequence to the nation.

66 Summer maintenance of Horned Cattle, &c.

And what renders this species of culture, more than ordinary promising is, that the simplest operations, and simplest machines, (provided they are fit for work) will perform all the business.

SECOND EXPERIMENT, *on the Summer maintenance of Horned Cattle, Horses and Swine, upon broad red Clover.*

The field under this experiment, is No. 19, in my Map, and contains *grass* measure 4A. 2R. 10P. And for eight years has been as follows.

In the year 1763. Two acres under potatoes, the rest fallow.

In the year 1764. Under Turnips and Cabbages.

In the year 1765. Under Cabbages.

In the year 1766. *Winter* Oats, and Wheat, both drilled, and a slip under spring Oats broad-cast.

In the year 1767. Under fallow.

In the year 1768. Wheat drilled different kinds, in alternate rows.

In the year 1769. Under Oats broad-cast, and sown with clover.

In the year 1770. Under clover, the use of which is to be our present subject.

This field is bevel on one side, and in order to have it square for my former culture upon it, I sowed a slip with oats, broad-cast in 1766, and ray grass. The latter to save the seed myself, which, to purchase in *Dublin* is 18s. a barrel.

The potatoes at each end, (as described in my Report last year,) for *improving* the fence, giving a *drip* to the falling rains, enlarging the *profitable ground*, and making the *compost*, occupied 0A. 1R. 21P. the clover 3A. 0R. 26P. and they ray grass, ditches, and waste ground, 1A. 0R. 3P. making in the whole, our 4A. 2R. 10P.

On

On the 13th of *June*, I began to mow the clover for eight horses, four plough bullocks, and 43 pigs, which continued to supply them until the 13th of *July*.

As the large field No. 10, afforded pasture enough, I kept the *second* growth of this clover for hay, which I mowed on the 2d of *August*; and upon the most moderate calculation, it produced 20 loads of excellent hay.

On the 15th of *September*, there was again, a very fine growth of clover upon the field, which I could not turn into before, on account of the potatoes. However, imagining the horses would now rather lie upon the clover, than the potatoe tops, which were now become hard, I ventured to turn in eight horses, which remained here until the 8th of *October*.

The ray grafs afforded five barrels of feed, which, at the *Dublin* price, would amount to 4l. 10s. I shall only value it at half that price. And hay 4 load.

At each end of the field, I had three ridges of potatoes, for the purposes before mentioned, which altogether made 135 perch, running measure.

Besides these, I had a ridge on one side of the field, 33 perches long, which I let for 13s. 9d.

The 135 perch which I planted myself, produced 41 barrels and 7 stone of potatoes, which I value at six shillings a barrel; though I sold many barrels this year at ten shillings, but I put this value upon them, rather as an average price, little and big, as they run.

What the produce of oats and potatoes were in the year 1769, I have no distinct account of, but both were good crops; and the potatoes I am sure, more than paid the expence of manuring the field with the compost of the potatoe ridges, in the manner I described in my Report of last year, and therefore I shall not introduce that expence in this account.

4/135
123
12

41
6
246 =

68 Summer maintenance of Horned Cattle, &c.

But I manured the field again this winter, and shall introduce that expence, by which, I presume we shall find, that the potatoes, the second year, more than paid the expence.

Preparatory to planting the potatoes, I was obliged to take down the back of the ditch, which cost me *eleven pence* a perch, and is 24 perches long, and amounts to 22s.

Drawing out the dung for 135 perches of potatoe ridges, men and horses, came to 15s. Planting the potatoes to £1 2 6. Seed potatoes I was obliged to purchase, which cost me 40s. Weeding them cost 2s. 6d. Digging them was done by task, for which I paid *seven pence* a barrel, and came to £1 4 1.

For ploughing and harrowing the potatoe ridges twice, after digging the potatoes, in order to mix the earth and dung, men and cattle, came to 5s. 2d.

Labourers filling the manure, cost £2 1 0, Horses, at 12s each, come to £2 3 0. Spreading the manure, 52 rows, by task, at 5d a row, come to £1 1 8.

Bush-harrowing twice, for horse and driver, came to 2s. 1½d. Rolling twice, came to the same.

Picking up the stones and laying them in heaps, cost me, by the employment of children, 14s. and drawing them off, for men and horses 15s. The draft was pretty long, as I intend them for drains in another field, where no stones are.

From these particulars, I shall state the account of loss and gain upon this field, for this year 1770.

Dr.

15 10 11
15 10 11

70 Summer maintenance of Horned Cattle, &c.

Dr. The Field No. 19, Containing in the Gross
4 Acres 2 Roods 10 Perches.

	l.	s.	d.
1769 To Cash by Clover seed 3Q. olb. at 52s	1	19	0
To Bush-harrowing rolling, and sowing	0	2	7½
1770 To taking down, and dressing the back of the ditch, 24 perches at 11d.	1	2	0
To drawing out the dung for 135 perches of potatoe ridges, for men and horses	0	15	0
To labourers for planting the potatoes	1	2	6
To Cash for seed Potatoes	2	0	0
To Labourers weeding Do.	0	2	6
To Do. digging 41 bar. 7 Stone at 7d	1	4	1
To ploughing and harrowing the pota- toe ridges twice to mix the manure	0	5	2
To Labourers filling the manure	2	1	0
To 43 horses drawing out Do.	2	3	0
To Labourers spreading the manure, 52 rows at 5d	1	1	8
To Bush-harrowing and rolling twice	0	4	3
To Children for picking up the stones	0	14	0
To Men and horses, drawing them off	0	15	0
To a Man mowing, and bringing home the clover 30 days at 8d.	1	0	0
To an horse chiefly employed in draw- ing home the clover, 30 days at 12d	1	10	0
To Mowing the second crop of clover	0	9	6
To making it into hay	0	18	0
To drawing it home and ricking	0	6	0
To Mowing, making, drawing and thrashing ray grass	0	5	0
To one years rent of 4 A. 2 R. 10 P. at 18s.	4	2	1½
To County Cefs, this field's proportion	0	4	1
	£24	6	6
To Balance by net profit	12	10	11
	£36	17	5

Summer maintenance of Horned Cattle, &c. 71

By Produce Cr.

	l.	s.	d.
1770 By maintaining <i>eight</i> horses from the 13th of <i>June</i> , to the 13th of <i>July</i> , being 30 days, at 5 <i>d</i> per horse per day	5	0	0
By maintaining <i>four</i> plough bullocks, the same time, at 3 <i>d</i> each per day	1	10	0
By maintaining 43 pigs the same time at 1 <i>d</i>	5	7	6
By 20 loads of clover hay, at 5 <i>s</i>	5	0	0
By maintaining <i>eight</i> horses, from the 15th of <i>September</i> to the 8th of <i>October</i> , being 23 days, at 5 <i>d</i> each per day	3	16	8
	£20	14	2

✱ It is worthy of observation here, that
3 A. 0 R. 26 P. of clover produced this sum
of £20 14 2, which is £6 12 6 an acre.

By 5 barrels of ray grafs seed at 9 <i>s</i>	2	5	0
By 4 load of ray grafs hay, <i>indifferent</i> at 4 <i>s</i>	16	0	
By 41 barrels 7 stone of potatoes at 6 <i>s</i>	12	8	0
By a ridge on one side of the field let for	0	13	9
	£36	17	5

41/130/3
121
1d

It is with particular pleasure, that I lay this account before the publick, because it affords several striking particulars of information; and although it does not amount to quite so much per acre in the gross produce upon the clover, in the first year, as the last field mentioned; yet, the greatness of it, uniformly shews the value of clover, and of which, I own, I had no conception, until I came to make these enquiries. £6 12, and £7 an acre gross produce, without any additional tillage, is, in my mind, a prodigious thing; and from the knowledge I have of the nature of my ground, compared with other land, I retain very little doubt, but that clover may be brought to afford a crop, worth 10*l*. an acre upon some ground; for, although both the fields before us, made a fine appearance, and were considered by the many who saw them, to be fine crops; yet, when I recollect the clover I have had, and have often seen with others in *England*, I cannot consider the crops before us, as being at the height of what I think may be obtained.

The charges on the debit side of the account, the reader may observe, are very high, and yet, there comes out a net profit, of £12 10 11, which, even after all the charges made, is £2 15 0 per acre.

This I conceive, must be a persuasive lesson to all improvers, that if they lay out money *judiciously* upon ground, they need not fear being amply repaid their expence.

But above all, in such pursuits, they should calculate to have their draft on manures, as short as possible. Upon this field, I put out 900 loads of the potatoe compost per acre, and by its being at *each end* of the field, the farthest load was not 20 perches, and every load, shortened the draft in each row, because, from one end, I only drew to the middle of the field, and after finishing there, began at the other end, and so met that already put out, half-way. These are the methods which give dispatch to heavy work, and execute with cheapness.

cheapness. And in this kind of business, particular attention should be given, to the proportioning the men to the cattle, in such a manner, that one shall not wait for the other, and to have them well attended by the master, or some other person of authority, and integrity*.

I might cover many more pages with this subject, by dividing the several articles produced in this field, into distinct accounts, of expence and profit; and I believe we should find them all more or less profitable, independant of each other; but I shall only do that in one particular—viz. the potatoe culture, in order to shew accurately, whether the potatoes do, or do not pay the expence of creating, and putting out the manure.

* Rare indeed to be found, as I have experienced.

Dr.

74 Summer maintenance of Horned Cattle, &c.

		l. s. d.		
Dr. Potatoe Planting in Field No. 19,				
1770	To taking down, and dressing the back of the ditch at <i>one</i> end, 24 perches at 11d	1	2	0
	To drawing out the dung	0	15	0
	To Labourers planting the potatoes	1	2	6
	To Cash for seed Potatoes	2	0	0
	To Labourers weeding	0	2	6
	To Do, digging 41 bar. 7 stone at 7d	1	4	1
		6	6	1
	To net Profit	6	1	11
		£12 8 0		

		l. s. d.		
1770	To Ploughing and harrowing the com- post twice	0	5	2
	To Labourers filling the manure	2	1	0
	To 43 horses drawing out	2	3	0
	To Labourers spreading the manure	1	1	8
	To Bush-harrowing and rolling twice	0	4	3
		5	15	1
	To net profit yet remaining	0	6	10
		£6 1 11		

Summer maintenance of Horned Cattle, &c. 75

With a View to making Manure; &c. Cr.

	l.	s.	d.
1770 By Produce 41 barrels 7 stone at 6s.	12	8	0

£12 8 0

	l.	s.	d.
1770 By Gain in preparing the manure or compost	6	1	11

£6 1 11

Here we see the merit of this method of making manure in the field it is intended for. *ix Shillings and ten pence* profit remaining by the preparation, even, after paying the expence of putting out 900 loads an acre, spreading and all other charges. I conceive this to be a prodigious thing to the farmer. But when we add to this consideration, the improvement of the fence, giving a drip to the falling rains to run off, and *for ever* enlarging our dimensions of the profitable ground, I trust I shall be justified in earnestly recommending this method to the practice of the farmer. I have now pursued it for three years, and have such abundant reason to be well pleased with it, that I shall every year enlarge my scale upon this plan.

I shall just observe, that where the fields are small, the quantity of compost will be almost inexhaustible, unless an adjoining field happens to be so circumstanced, as to be capable of receiving it, or in want of it, which will be the case, where the ditches belong to the next field or fields—I have some so circumstanced.—This is in case fields are small, but where they are large, it will be prudent to make the compost vastly richer, by a second or third mixture of dung, or other enriching bodies, as the compost must be laid the thinner, to reach over the whole field.

I shall now trace this field a little further, and shew some other improvements made in it, as I intend every year hereafter, to give it a place in my reports.

The land is of a stiff kind, holds the water, and was naturally wet;—when I began with it, poor to a great degree, full of loose stones, over a lime-stone quarry, near the surface, and many large stones hidden, which used to interrupt the plough: Those are removed, and by bold and strong tillage, frequently repeated, I now have a staple of twelve and eighteen inches deep; for I observe, by strong tillage, that in a course of years, the land swells surprizingly, even where no manure has been yet applied; but this field has increased

creased in depth of soil, by the united powers of tillage and manure.

On the north east side, the ditch was made a year or two before I took the farm; but it was not half sunk; I suppose it was some of the *cheap* task-work which I sometimes hear of, (the bane of perfection in every thing) and therefore the men could not think of encountering the stones.—By this means, the fence was nothing, only an apology for one, by the constant passage of cattle over it, wherever they pleased, it was in a manner filled up; and in short was next to no fence.—Consequently, here was no way for this and the adjoining field to discharge the water, which greatly annoyed them both.

I determined to remedy these evils.—I therefore set this ditch to be sunk *five* feet perpendicular in every part, at fifteen pence a perch, which I suppose was more than was originally given for it. The poor men really laboured hard, and executed their work completely—I kept an account of their time, by which I saw the price was not adequate to their labour, and therefore paid them *eighteen* pence a perch, and eight shillings for the stones they raised. The ditch was thirty-six perches long.

After this ditch was finished, I paid *eleven* pence a perch, for taking off the back, in the manner I described in my report last year; and now, I have every reason to be pleased with this piece of work, for I have a noble fence, which I think, when all the potatoe compost is taken away, will bid defiance to any hunter upon earth *without wings*.—And above all, by sinking so deep, it was surprizing to see all the winter, what a stream I had running in the ditch, by having cut across the veins (if I may so call them) of the springs.—But this summer, which is remarkably dry I cannot but look with particular pleasure at the ditch, and more particularly at the side next this field, to see it constantly wet, by the springs weeping out of our field No. 19, which used to be sick with water.

Besides

Besides this improvement, I scoured the ditch at the upper end, which used to be brim-full of water, almost winter and summer, and intend to sink it *five* feet perpendicular.—To take the water away, I was obliged to pursue the scouring one hundred and fifty perch; to sink other ditches one hundred and ten perch, and sunk through an hill thirty perch long, in some places fourteen feet deep, and now, where water never run before, this drowning of the land runs off—but these works will be proportioned to their boundaries upon every field, in my future accounts of them and their progress, upon the general plan which I have now laid down to pursue for the publick inspection, and I hope, information.—The proportion of scouring, to the field before us, cost me eleven shillings and six pence.

At one corner of the field, was an ingenious contrivance, as an occasional passage for *cows* and *cattle*, by pulling down, and making up the fence, with earth and stones.—This was made a frequent way by strolling foot passengers, wherever they pleased without mercy over this and the adjoining fields.—To stop this inconvenience, and to compleat my fence, I built a stone-wall in this place, which cost me, for lime, sand and workmanship, £1 11 6.—The stones, with some gathered off the field, built the wall.

I have also built a pair of piers, and hung a gate, in a very compleat manner to this field; and made a new sewer at the gate-way, of lime and stone, so that a man may go in to clean it.—I compute that every pair of piers, with the gate, irons, sewer, and flank walls, stand me in about five guineas.

I shall now restate the account of this field, in order to lay before the reader, the whole expence, that that he may be able to form a judgment as I go on with it hereafter, how far the produce of the land, year after year, will be able to defray the expences of such improvements as are already done, and to be done.—

Dr.

Dr. The Field No. 19. 4 acres, 2 rood, 10 perch upon the General Plan of its most *Perfect* improvement, thereby taking in every article of expence.

1770. To the total expence, as already stated in page 70	24	6	6
To sinking the North east ditch 36 perchs at 18d	2	14	0
To the stones raised out of ditto	0	8	0
To taking off the back of this ditch at 11d	1	13	0
To scouring another ditch	0	11	6
To building a wall of lime and stone	1	11	6
To a pair of piers, gate, sewer, &c.	5	13	9

Total expence	36	18	3
By total produce in the year 1770	36	17	5

Balance against the field upon the general account 0 0 10

Thus it appears, that after executing such very considerable works upon this field, as to amount to £36 18 3, that it remains indebted to me, only *ten-pence*—Without enlarging upon it, I shall only observe, that the event of this enquiry confirms me in an opinion, which I have long retained, that £20 an acre (I am not clear that I might say £30) may be safely laid out upon land; provided, the money be *really* laid out, and, that the improver is not *too much* imposed upon.—The improvements made here, in the field before us, are *beautiful*, and *substantial*.—I find convenience and pleasure in them, and hope they will be animating to others, as I shall every year lay before the publick, the progress of this piece of ground; and also, introduce others, with an exact account of the expence and produce, since I find, it is fields in exhibition that must *persuade* the *bulk* of mankind; smaller experiments will inform the ingenious; those I shall also introduce, and carry on with the most minute exactness.

An Experiment on Potatoes.

I having lately, heard very much of the prolific nature of a new species of potatoe, called the apple-potatoe; and every day (I own, contrary to my former opinion) finding of how much consequence, potatoes are to the labouring people of this kingdom, I became desirous of obtaining some of this sort.

I endeavoured in vain, to procure a barrel of them, with an intention of planting them in the spring 1770.—However, on the 8th of *May*, a servant of mine procured two stone of them somewhere for me, for which I paid 2s. 2d.—On the 9th I planted them.

I had a small piece of ground in my orchard which had been dug in the preceding winter, intended for other purposes—this ground I chose.

The two stone of potatoes, were cut into as many pieces for seed, as they would admit of.—I planted *eighteen* rows with them *three* feet asunder, and the *sets*, twelve inches in the rows, and the rows were fifty feet long.

They came up very well, and flourished away at a great rate. I had the intervals once dug with spades, and the plants kept free from weeds, by twice weeding.

On the 9th of *November*, by carelessness, some of my swine got at them, and played wicked work amongst them.—On the 10th, I had them dug,—The produce was as follows.

	stone	lb.
The <i>first</i> row produced	4	13
The <i>second</i>	4	4
The <i>third</i>	4	10
	13	13

The average of each row, 4 stone 9 pounds.

The third row, as being nearest the average, I had separated into four sizes, in the following manner.

Of the largest	76 potatoes,	weight	3ft. 2½ lb.	Average
			per potatoe	9 oz. ½
Of the next large	62 do.	do.	1 0½	do. 3 ½
Of the next	42 do.	do.	0 4½	do. 1 ½
Small ones, which passed through the riddle*	were 62			
	potatoes,	weight	3 lb.	Average ½

This little table of produce affords great information, as to the value of this species of potatoe; for we see they are very large, with very few small ones, which is a great recommendation of this kind; whereas, most other kinds that I have had, are some, half small ones, and others a third, which is a great drawback upon their value.—Here we see, that we have only three pounds of small ones, out of four stone ten pounds, which is only one twenty-second part; a circumstance which makes me think very highly of this potatoe.

* When I entered spiritedly into the culture of potatoes, I found every stage of the business expensive; but that was unavoidable, and therefore I was reconciled to it.—But when the potatoes come to be "*picked*" as they call it, I lost all patience.—I was one year run to near 4 l. expence for picking potatoes, and my quantity, I am sure not 60 barrels.—It is the finest lazy work that can be conceived; men, women and children, all sitting, lying, kneeling, smoking, and chattering, without any regard to the business, but to *NURSE* it as long as they can.—I told them that year to make the most of it, for that I believed they would be the last potatoes that I would ever have picked.—Accordingly, against the next year, I got a large riddle made of very strong iron wire, the meshes one Inch ½.—I set to work with this, a man and boy. I am sure they will do more in a day, than forty pickers.—The riddle cost me five shillings and five-pence, and I am persuaded has saved me twenty pounds since I had it.—But I find I must have a set of them of different sizes.

The whole eighteen rows, produced three barrels eighteen stone and six pounds; and I dare believe, the swine destroyed half a barrel.—However, what I did obtain, amounts to about one hundred and three barrels per acre.

We have already seen, that the small ones amounted to only one twenty-second part of the produce; which, in the proportion of one hundred and three barrels per acre, will be about four barrels thirteen stone two pounds and a half.—Let us state this.

	Bar. St. lb.
Gross produce as before ascertained, per acre	103 0 0
Deduct for small ones	4 13 2½
	98 6 11¼

The remainder we see, is 98 barrels of merchantable potatoes, even though they were planted so late as the 9th of *May*.

I kept what I had of them this spring. I caused some of them to be boiled in a pot by themselves, and some other kinds in different pots; and had them put before my boys, for their sentiments upon their quality for eating. They all preferred the apple potatoe, although the other kinds were very good. I eat of them myself, and I found them surprizingly dry and mealy; and they appeared to me to be an hearty strong food, much beyond any other, that ever I eat of. But there was one circumstance, which struck me very strongly. When I went to the boys, to ask them which they liked best, one of them who is, and I believe ever will be a slovenly fellow, was powdered from the chin to the waste, as if meal had been thrown upon him, by his breaking the potatoes he eat of, and letting them crumble upon his cloaths; this is a striking proof of their prodigious dryness.

All

All these circumstances, induce me to look upon the *apple-potatoe*, as a great acquisition to the poor labourer, who ought to have every assistance that nature and ingenuity can furnish, to lessen his expence of living; but I apprehend, this potatoe will never be acceptable at the Gentleman's table, as they are strong, and very unsightly; but I am convinced, an *heartly* food, for a working man.

THE END.

103
20
2060

103

flour

103/6

618 F₂ 30:18:0.

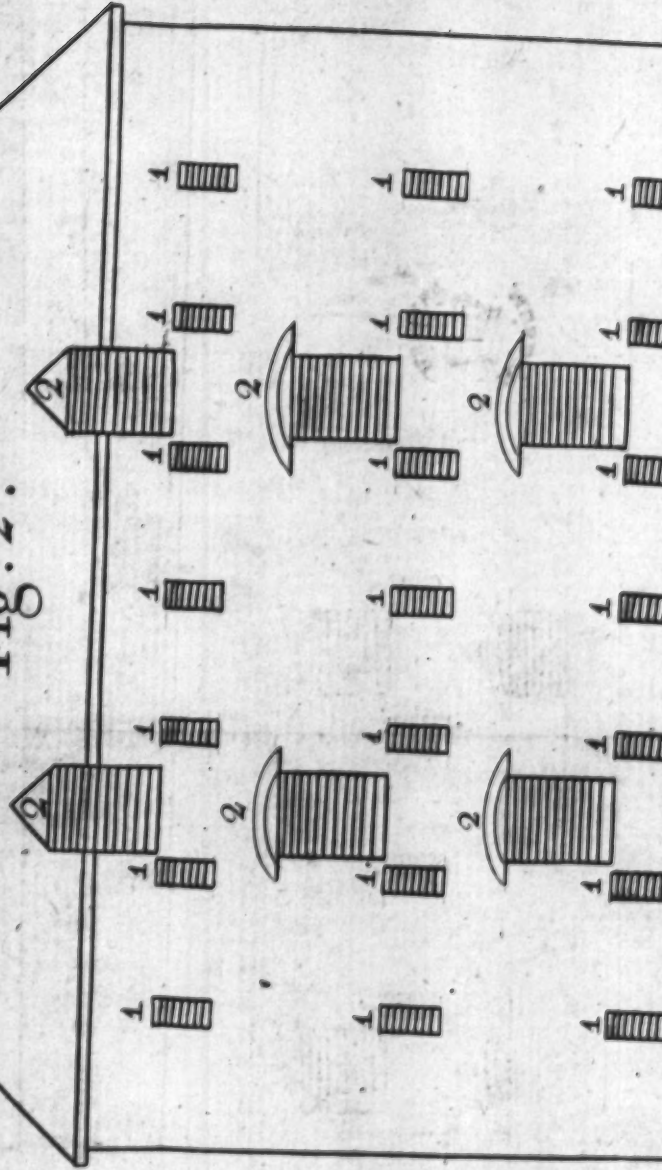
Ground Plan. 40 feet by 16 in the clear.

The Walls 2 feet thick.

Fig: 1.

8 feet to an Inch.

Fig: 2.



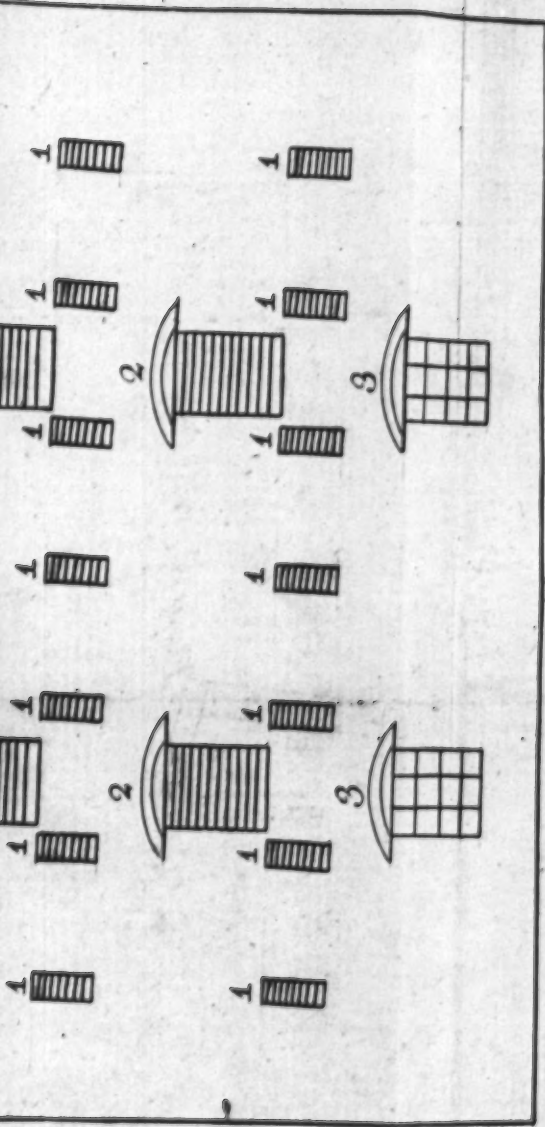


Fig: 3.

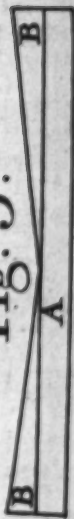


Fig: 4.



Fig: 5.



Fig: 6.

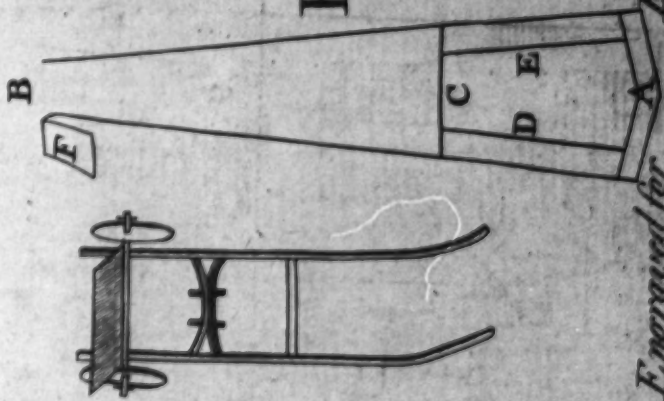
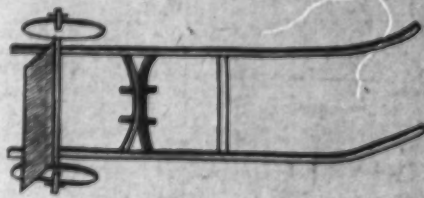


Fig: 7.



Engraved for Experiments in Agriculture, 1770.

*A PLAN and description of a new constructed
GRANARY, for the preservation of
thrashed CORN.*

I N my Report for the year 1768, I furnished the publick with a Plan of a new constructed Barn, which I have the pleasure to hear, has been so well received by some Gentlemen, as that they have built Barns from that Plan.—From thence I am encouraged to fulfill my promise of a Plan for a new constructed Granary.

I shall not enter into a description of the offices which are generally built for Granaries; their inconvenience, and injury of the Corn lodged in them, sufficiently bespeak their impertection; neither shall I say any thing of the utility, or inutility of Granaries in a national view.—No doubt, they are necessary offices to the Gentlemen and the farmer; upon that I rest my justification for laying the following Plan before the publick.

The injuries to which Corn is liable in Granaries are many.—I shall name a few.—viz.—*Dampness, must, fermentation, sprouting, insects, and vermine.*—The improper construction, and imperfect building, want of air, and occasional heat, and the vast expence which attends the giving the Corn frequent motion, which is necessary to its preservation, are the causes.

The above injuries I propose to remove, by the latter remedies, in the construction of the Granary, which I now offer to the consideration of the publick, by which I do conceive, that corn may be kept as long as may be thought necessary or prudent, notwithstanding the moving of it, I apprehend, need be but seldom.

The dimensions which I have chosen for the present Plan, will be no rule to any man, who may be disposed to adopt my ideas of a building of this kind;

as upon the same principles, it may be built upon any scale, which he may apprehend, will answer his purpose.

Fig. 1.—Is the ground Plan, and sufficiently explains itself in the plate.—And therefore, all that I have to observe upon it is, that I would have the walls built with the greatest care from the *first* stone, and most carefully grouted to the first story *at least*.—I would have the earth taken out of the area, as deep as the foundation, and fill the whole, with the smallest stones I could get, and then grout the whole, as long as it would take any mortar wash, and level all off quite fair.—Upon that plane, I would lay my joice for the ground floor, and level up to their surface with brick-work, perfectly well executed, and then grout with mortar finely sifted, to compleatly fill every crevice.—These precautions will I think keep out rats and mice.

As these joice will have thorough bearing, I think they need not be above 3 inches by 2 or $2\frac{1}{2}$.—I should choose them of oak for *this* floor, which is to be a level one.—

Fig. 2.—Exhibits one side of the building, and by the eight windows marked 2, shews, that there are to be four floors*, besides the ground floor. These windows are all to be neatly weather-boarded, and lined with very open canvas, to keep out birds, unless wire shall be preferred, which is certainly better.—The fills of these windows, are all to be placed immediately upon the joice.—The inside jams of these windows, are to have a neat frame, two feet high, the breadth of the windows, with some slips of single cut deal, about 3 inches deep, and 2 or $2\frac{1}{2}$ inches asunder, put in those frames perpendicularly, edgeways, with the sharp edges just taken off with a plane, and then lined with hair-cloth, for the corn to lie against, when the floor are full of grain.

* If I were to build a Granary, for the stowage of a great deal of Corn, I would put six floors, besides the ground floor.

Fig.

Fig. 3. A shews the joice, which are to be 18 feet long, in order to have 12 inches bearing upon the walls; and should be very carefully bedded, so as to lie *level*.—But if that *attention* should be given, I should wish to have them touch upon the walls only about 2 inches, and the wall to *bevel back* as far as the *ends* of the joice, about $\frac{1}{4}$ or $\frac{1}{2}$ of an inch, by which means, when the *weight* of work comes upon the *ends*, the joice will *buckle up* a little in the middle, and thereby form some small degree of an arch, which cannot fail I think, to add to their strength. I should choose these joice 12 inches deep, and $2\frac{1}{2}$ thick.—The upper edges must be shot with a long jointing plane, for a reason which will appear immediately.—B B are to consociate with, and become part of the joice, viz.—A piece 9 feet long, 12 inches deep, and $2\frac{1}{2}$ thick, is to be cut from *corner to corner*, and spliced upon the joice A, in the manner represented in the figure; the edges uniting the joice, being first shot with a plane, to make a fair and even joint, with the upper edge of the main joice A, which was before directed to be shot also.—Thus it appears, that each side of the floors, are to have an inclination of about 12 inches to their centre.—And I would have every joice, and the space *between* them, to occupy one foot; consequently, the spaces between the joice, will be $9\frac{1}{4}$ inches.

Fig. 4. A pair of joice. A A slips let down between a pair of joice, which should be 3 or 4 inches deep, and about $\frac{3}{4}$ thick, placed edgeways, 3 or $2\frac{1}{2}$ inches asunder, and their *upper* edges to be taken off, so as to make them a little round, to prevent their cutting the hair-cloth, with which they are to be covered, instead of boards. B B B B represent, that for a foot from the walls, this pair of joice are to be covered with a board, and the same from the centre of the floor, with a crevice in the centre C, between the joice, for a purpose hereafter to be mentioned, and this crevice is to run from end to end of each of the upper floors, where the corn is to lie.—D D are no more than the ends of the joice, which are to lie in the walls,

walls.—Every 5th joice is to match with the 6th in order to make a pair to be formed in the manner just described (fig. 4.) on one side the building, and every 5th and 6th on the other side, in the same manner, by which, these admissions for air *under* the corn, will intersect each other, and admit a great body of air.—But the front, Fig. 2. shews, that the air-holes to each pair of joice so covered with hair-cloth, are to be at only *one* end of one pair, and at the *other* end of the *other* pair; consequently, these air-holes marked 1 in fig. 2, will also intersect each other, from the two sides of the building. All the little seeming windows in the front marked 1 in fig. 2, are not intended for windows, but the air-holes just mentioned, and are to be *between* the joice only at *one* end of one pair, and at the other end of the *other* pair, covered with hair-cloth, in manner before mentioned. For these air-holes there must be little frames made, and weather boarded very neatly, with narrow slips.—And I should choose, that *between* the joice opposite these air-holes, should be filled with mason work 12 inches high, and beveled off from

thus,  *inside to outside to the bottom of the air-holes, as*

and neatly plastered; by this means, the joice will be firmly fixed, and the air will have free admission.—Thus, the *intention* appears, of admitting the air *under* the corn, which it will pass up through the hair-cloth, and through the corn.—This I conceive to be the grand preservation of corn from *must, beating, sprouting, or insects.*

Fig. 6. Is a tube, for the attraction of air through the corn—to be *five* feet long from A to B, *open* at the top, but *close* at the bottom; and made bevel in the bottom, to fit the bevel of the floor.—I would have it 18 inches broad, and 6 or 8 inches deep in the clear—From A to C and D to F, to be covered with hair-cloth on each side.—By this means, I conceive the air will pass easier through the *deepest* part of the corn, than without these tubes.—The tubes are to be moveable—one of them is to be placed as the granary fills with grain, in the centre over each pair of joice which are covered with hair-cloth.—And directions should be given to the men who go into the granary to be careful not

not to hurt them, by rough usage, as they will require but slight stuff.

Fig. 5. As the floors all incline to the centre, 12 inches in 9 feet, there will be no convenient walking place for men to take the corn to the furthering of the building. —And as the intention is, to have all the corn which goes into the granary, first lodged upon the *upper* floor: —I would have as many planks, about $2\frac{1}{2}$ inches thick, and 18 broad, as would reach from the landing place on the *upper* floor, to within 6 feet of the further end of the loft, to be laid occasionally along the middle of the upper floor when corn is coming in, and always to be kept in this loft; but I would have them in distinct pieces, of not less than *five*, nor more than *six* feet long, by which means, as the farther end of the loft shall be filled with grain, a plank will be taken up, and then fill to the next, then take that up, and so on. —Under each end of these planks, a block, as represented in figure 5 is to be spiked on, in order to lie compleatly to the bevel of the floor, and as the sack lands from the pully to the landing place of this floor, a man whips the barrow fig. 7, under it, and trundles away the barrow to the other end along the planks just described, starts the corn, and comes back again to receive the next sack, and throw down the empty one.

Fig. 2. The two windows to the ground floor, marked 3, are to be glazed, merely to give light, as the intention is, for no corn to be kept upon that floor for any time.

At one end of the building, the floor must be level for about 4 feet in each floor, and a little partition about three feet high at each end, and about four in the middle, with a pair of folding doors about four feet wide, to admit the barrow and sacks in the upper floor, and in the lower ones for the passage up, and into each floor or room. —When the upper floor is full, the doors to be shut, and the corn leveled in its surface. —But as the corn is taking in, let it not be forgot, to place the tubes fig. 6, in their respective places. —To these tubes fig. 6, for the three under floors, it will be necessary to have some kind of cover, as F fig. 6.

G

hung

hung by a little hinge, to cover the tubes, when the corn is to be let run from one floor to another, otherwise, they will fill with corn, which would destroy their intention.

In the centre of each landing place to each floor, must be a pair of trap doors, to admit the sack and people up and down.—And there must be a pully erected to work to the *upper* floor only; and it may be made to in that, or the ground floor as may be most agreeable.

Under each floor, and *between* every pair of joice, there must be a little slider neatly fixed, to draw backwards and forwards, under the crevice C in fig. 4.—When the upper floor is to be filled with corn, these sliders must all be shut,—and, when the corn is to let down to the next floor, the sliders must all be drawn back, and from the *bevel* of the floor on each side, the corn will pass down in one thin sheet through the crevice C in fig. 4.—The same operation will move the corn from one floor to another, from top to bottom, so that the upper floor full of corn, will get four of these motions, before any labour will be wanting to get it up again by the pully.—Here we find the use of the inclination of the floors from each side to the centre, as described in fig. 4.

I would have the entrance into this granary at one end of the building, provided only one kind of grain is to be kept in it; and a pair of scales hung on the ground floor, for weighing off all corn that comes in, and all that goes out—but no great quantity of corn should be kept upon the ground floor, that should be *free* for the reception of the corn, as it comes down from floor to floor.—The bottom of the door of entrance, should be lined with plate iron, to prevent vermine gnawing, and if the sill is not of stone, let it be also plated.

In boarding all the upper floors, I should recommend their being done with feather-edged boards—i. e. the lower edge $\frac{3}{4}$ thick, and the upper $\frac{1}{4}$ or $\frac{1}{2}$ only, letting the thick edge *lap* sufficiently over the thin one.—The corn will run down easier in that case, than were the boards

boards all even—But let a birch broom be kept in each floor, in case any grains stick any where, a little touch of the broom will set all in motion.

All the places where hair-cloth is nailed on, the margins where the nails are drove, must have a slip of leather, which should be bazil, and on no account alum'd leather, as that will soon rust the nails.

The whole building must be neatly plastered from top to bottom.—In the setting out, I guarded against vermin working through the walls, or ground floor.—To prevent their creeping up the walls to the windows, or air holes, let the building be well stocced on the outside, all round from the bottom of the lower windows to the bottom of the first row of air holes.

To each floor in each gable, I would have a large window glazed, to give full light.—

I think in this granary, the corn may safely lie two feet thick on each side, consequently it will be *three* feet thick in the middle.

If at any time in a long continuance of damp weather in winter, the proprietor should wish to convey any heat to the corn, let a stove be brought to the ground floor, under the trap-holes, let them all be opened—and a good fire made of *Kilkenny* or *Cbarcoal* for two or three days.—And if any insects *should* happen to be in the corn, which I much doubt, let all the windows be stopped, and small quantities of brimstone thrown upon the fire, so as to fill the whole building with its fumes, and that will soon destroy them.





Sow a Rape 9th June 1771